HEALTH ECONOMICS RESEARCH, INC.

411 Waverley Oaks Road, Suite 330
Waltham, MA 02154-8705
(781) 788-8100
(781) 788-8101 - FAX

Medicare Participating Heart Bypass Center Demonstration

Volume III

Final Report

Prepared by:

Jerry Cromwell, Ph.D.
Debra A. Dayhoff, Ph.D.
Nancy T. McCall, Sc.D.
Sujha Subramanian, Ph.D.
Rachel C. Freitas, B.A.
Robert J. Hart, B.A.

Health Economics Research, Inc.

With:

New England Research Institutes

Cheryl Caswell, M.B.A.

and:

William Stason, M.D., M.P.H.

Prepared for:

Armen H. Thoumaian, Ph.D., Project Officer

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Appendix A

Calculation of 1992 Update Amounts

ATTACHMENT

CALCULATION OF 1992 UPDATE AMOUNTS

I. OVERVIEW OF PART B CALCULATION

A. RBRVS Update Calculation

The Part B estimate of 1992 payments was derived by combining RBRVS rates for specific CPT-4 codes of the most essential physician services for DRG 106 and DRG 107 with estimates of other physician services typically occurring during the CABG surgical episode.

In determining the most typical mix of services for an inpatient heart bypass graft surgical episode of care, 36 DRG 106 cases and 78 DRG 107 cases submitted from Saint Joseph's Hospital of Atlanta under the demonstration were reviewed. The most frequently occurring CPT-4 codes were listed along with the average number of units or occurrences per case. The CPT-4 code for the three graft bypass surgery was used as a conservative representation of the typically occurring bypass surgery code. These are listed as follows:

	Number of Service Units		
	DRG106	DRG107	CPT-4 Code
Surgery	1	1	33512
Arterial Cannulation	3	3	36620
Assistant Surgeon	1	1	33512ASQ
Anesthesiology	20	20	00562
Swan - Ganz Catheter	1	1	93503
Cardiac Catheterization	1	0	93547
Electrocardiogram	5.4	5.1	93000
Radiological Exam 1 view	5.8	6.4	71010
Radiological Exam 2 view	2.8	2.9	71020
Initial Physical Exam (discontinued - replaced by 99223)	1	1	90220
Intermediate Exam (discontinued - replaced by 99233)	4.4	4.4	99173
Follow-up Exam (discontinued - replaced by 99231)	3	3	90260

Resource Based Relative Value Scale rates were derived by applying the method of calculation described in the November 25, 1991 *Federal Register* (volume 56, No. 227) to the bundle of physician services provided for a CABG surgical episode. The formulas for calculation of the rates are written below. The data for these calculations were derived

from two sources. The carrier based units and units by CPT-4 code for work, practice cost and malpractice expense are listed in the *Federal Register*. The Historical Payment Amount was obtained from the Medicare Carrier for each hospital.

Formulas:

1. Fee Schedule Payment Amount Formula:

$$A = ((w * W) + (p * P) + (m * M)) * F$$

Where:

w = Relative Value Unit by CPT4 code for Work
p = Relative Value Unit by CPT4 code for Practice Cost
m = Relative Value Unit by CPT4 code for Malpractice Expense
W = Carrier Based Geographic Cost Index for Work
P = Carrier Based Geographic Cost Index for Practice Cost
M = Carrier Based Geographic Cost Index for Malpractice Expense
F = National Conversion Factor

2. Transition Payment Amount Formula:

If $A > (1.15 * B)$ then $Y = (A - (0.15 * B))$
If $A < (0.85 * B)$ then $Y = (A + (0.15 * B))$
Else $Y = B$

Where:

A = Historical Payment Amount
B = Fee Schedule Payment Amount
Y = Transition Payment Amount

RBRVS transition payment amounts were calculated for each CPT-4 code listed above for your hospital.

The attached table shows the listing of historical payment amounts, RBRVS indices and the calculated transition amounts for each of the CPT-4 codes listed above (see Table 1). Note that these are the area wide amounts used by the Medicare Carrier and not hospital specific.

Next, the hospital specific 1991 Medicare allowed charge amounts were obtained for comparison with the transition amounts. Both the 1991 Medicare allowed amounts and the 1992 transition payment amounts were multiplied by the average number of units or

services for each CPT-4 code and the differences between each payment amount calculated. The sum of these differences became the RBRVS update amount (see Table 2).

B. Data Source for the Calculation of the Resource Based Relative Value Scale (RBRVS) and Fee Schedule Payment Amount

The following section lists relevant data sources used in the calculation of the fee schedule adjustment. The documentation used to calculate the RBRVS rates are contained in the *Federal Register*, Volume 56, Number 227, Monday, November 25, 1991, Part II, Department of Health and Human Services, Pages 59502 to 59819.

The Formula is contained in Addendum A pages 59629 to 59630, entitled *Technical Documentation/Explanation and Guide to Use of Physician Fee Schedule Tables.*

Formula:

Payment= [(RVUw X GPCIw) + (RVUpe X GPCIpe) + (RVUm X GPCIm)] X CF

RVUw	=	physician work relative value units for the service
RVUpe	=	practice expense relative value units for the service
RVUm	=	malpractice relative value units for the service
GPCIw	=	geographic practice cost index value for physician work applicable in the fee schedule area
GPCIpe	=	geographic practice cost index value for practice expense applicable in the fee schedule area
GPCIm	=	geographic malpractice cost index value for physician work applicable in the fee schedule area
CF	=	uniform national conversion factor

CF - uniform nation conversion factor = 31.001
found on page 59630, *Federal Register* November 25, 1991

The **Relative Value Units (RVUs) and related information** are contained in the *Federal Register* November 25, 1991, Addendum B, pages 59635 to 59784.

For example:

HCPCS 33112 page B-37

HCPCS	Work RVUs	Practice Expense RVUs	Mal-Practice RVUs	Total RVUs
33512	26.41	38.61	6.76	71.78

The **Geographic Practice Cost Indices by Medicare Carrier Locality** are contained in the *Federal Register*, November 25, 1991, Addendum C, Pages 59785 to 59790 which lists the following:

Carrier Number	Locality Number	Locality Name	Work	Practice Expense	Mal-Practice
1040	1	Atlanta, Georgia	0.975	1.022	0.752

II. PART A PROSPECTIVE PAYMENT SYSTEM CALCULATION

A. Part A PPS Operating Rate Formula

The Part A update amount is the difference between the 1991 and 1992 DRG operating amounts. The 1991 and 1992 DRG rates were derived by applying the method of calculation described in the September 4, 1990 and August 30, 1991 editions of the *Federal Register*. This amount contains the basic DRG rate plus adjustments for teaching costs and disproportionate share cost and is calculated using the following formula:

DRG Operating Amount = [(DRGbp) + (DSP * DRGbp) + (IME * DRGbp)]

Where:
DRGbp = DRG Base Payment
DSP = Disproportionate Share Adjustment
IME = Indirect Medical Education Adjustment

The DRG Base Payment is computed as follows:

DRG Base Payment = ([(LS * Wg) + (nLS * COLA)] * (DRGwgt)

Where:

LS = Labor Share
nLS = Nonlabor Share
Wg = Wage Rate
COLA = cost of living adjustment
DRGwgt = DRG relative weight

Where Labor Share and Nonlabor Share are derived from:

IF [(NaLR+NaNLR) > (RaLR+RaNLR)]
THEN Labor Share = NaLR
AND Nonlabor Share = NaNLR

IF [(NaLR+NaNLR) < (RaLR+RaNLR)
THEN Labor Share = [(NaLR*.85) + (RaLR*.15)]
AND Nonlabor Share = [(NaNLR*.85) + (RaNLR*.15)]

Where:

NaLR = National Adjusted Standardized Amounts for Labor
RaLR = Regional Adjusted Standardized Amounts for Labor

and
NaNLR = National Adjusted Standardized Amounts for Nonlabor
RaNLR = Regional Adjusted Standardized Amounts for Nonlabor

In calculating the Labor Share and Nonlabor Share for each hospital, the National Adjusted Standardized Amounts for labor and nonlabor for large urban, or other urban areas is compared with each hospital's Regional Adjusted Standardized Amounts for that hospital's large urban or other urban area. If the national amount for labor plus nonlabor exceeds the regional amount for labor plus nonlabor, the labor share (or nonlabor share) equals the national amount for labor share (or nonlabor share). If the combined national amount is less than the combined regional amount, then the labor share (or nonlabor share) is equal to 85 percent of the national amount plus 15 percent of the regional amount for labor share (or nonlabor share).

B. Part A PPS Data Sources

1. Figures Used for the FY 1992 calculations:

The calculations for the Prospective Payment Rate for FY 1992 are based on the formula described on pages 43248 and 43249 of the *Federal Register*, Volume 56, Number 169, Friday, August 30, 1991. The same formula is used in the calculation of the Prospective Payment Rate for FY 1991 which is described on pages 36077 to 36079 (see Table 3)

The 1992 calculations based on figures obtained from the *Federal Register*, Volume 56, Number 169, Friday, August 30, 1991, Part IV, Department of Health and Human Services, Pages 43196 to 43524.

The **National Adjusted Standardized Amounts, Labor/Nonlabor** are contained in Table 1a on Page 43249. The figures for Large Urban hospitals are used. The **Regional Adjusted Standardized Amounts, Labor/Nonlabor** for Large Urban areas were taken from Table 1b on Page 43249. The **Wage Index for Urban Areas** is contained in Table 4a contained on pages 43274 to 43279. The **Relative Weights for DRG 106 and DRG 107** are contained in Table 5 on page 43284.

The **Disproportionate Share (DSH) and Indirect Medical Education (IME)** factors were based on the hospital specific values developed by HCFA that were used in developing the Fiscal Year Final Rules. The Disproportionate Share percentage is compiled from two components, the SSI component and the Medicaid component. For the SSI component, a list of disabled Social Security recipients receiving Supplemental Security Income (SSI) is compiled and matched against the Medicare Provider Analysis and Review (MEDPAR) files and the number of inpatient admission days for these individuals is counted per hospital. A ratio is calculated of this number divided by the total number of inpatient admission days for all Medicare patients. This ratio is the Medicare component of the

DSH. The Medicaid component of the DSH is the ratio of the number of inpatient admission days for all Medicaid patients listed in the hospital's cost report to the total number of inpatient admission days for all hospital patients. These two ratios are added together to reveal the Disproportionate Share patient percentage for that hospital. Finally, this DSH patient percentage is adjusted by the Medicare rules for Disproportionate Share to determine the DSH payment add-on.

The figure used for the Indirect Medical Education (IME) factor is obtained from information used by the Fiscal Intermediary for each hospital in pricing individual cases without accounting for the year end audit adjustment. This information is reported to HCFA as part of the Provider Specific File.

The **Cost of Living Adjustment** (COLA) for the continental United States is equal to 1.00.

2. Figures Used for the FY 1991 calculations:

The 1991 calculations are based on figures obtained from
Federal Register, Volume 55, Number 171, Tuesday, September 4, 1990, Part III, Department of Health and Human Services Pages 35990 to 36175 (see Table 3).

The **National Adjusted Standardized Amounts, Labor/Nonlabor** for large urban hospitals for 1991 are contained on page 36079 in Table 1A. The **Regional Adjusted Standardized Amounts, Labor/Nonlabor** for large urban areas are listed in Table 1b, page 36079. The **Wage Index for Urban Areas** for FY 1991 is listed in Table 4a, pages Page 36104 to 36109. The **Relative Weights for DRG 106 and DRG 107** are listed in Table 5, Page 36114. The **Disproportionate Share and Indirect Medical Education** factors for FY 1991 were derived in the same manner as that for FY 1992 using the appropriate earlier dated files.

III. THE 1992 GLOBAL PAYMENT UPDATE AMOUNTS

The DRG operating amounts for FY 1991 and FY 1992 were calculated (see Table 4). The difference between these amount formed the Part A adjustment amount. This amount was further adjusted by the RBRVS adjustment amount (Table 2) leaving the total 1992 update adjustment amount for each DRG. This amount was added to the 1991 global price amounts for DRG 106 and DRG 107 to reveal the 1992 global payment amounts (see Table 5).

Appendix B

Evaluation of Clinical Coronary Angiography Results by Quantitative Angiography

9.0 EVALUATION OF CLINICAL CORONARY ANGIOGRAPHY RESULTS BY QUANTITATIVE ANGIOGRAPHY

9.1 Introduction

9.1.1 Rationale

Coronary angiography results are one of the major determinants of the choice of treatment for coronary artery disease with CABG surgery, angioplasty, or medications. Accurate assessment of coronary artery anatomy and the extent of disease is critical to sound clinical decisions. At the same time, clinical interpretations of coronary angiograms involve considerable subjective judgment and have been amply demonstrated to exhibit marked inter- and intra-observer variations(ref). Hence, the potential exists both for errors in individual cases and for systematic biases that lead to inappropriate choices of treatment.

Quantitative angiography using computerized edge detection techniques has been demonstrated to yield highly reliable and reproducible results (ref). For this reason, the technique has been used in a number of studies to evaluate the progression or regression of coronary artery disease in response to dietary or invasive treatments (ref). Clinical applications have been limited, however, and insufficient evidence is currently available to document the superiority of quantitative angiography results in predicting responses to treatment.

The goals of this study are to:

1. quantify differences in estimates of the percent stenosis of lesions in the coronary arteries by clinical interpretations and quantitative angiography;

2. document any systematic differences among participating hospitals in the correlation between quantitative and visual estimates of the percent stenosis; and

3. evaluate clinical cardiac catheterization reports for the presence of clinically important information.

Previous studies have found that visual interpretations of coronary angiograms give systematically higher estimates of the degree of luminal diameter narrowing than quantitative angiography around the cutpoints for clinical decision-making (40 - 70 percent). Quantitative angiographic estimates, on the other hand, are higher in the 80 - 90 percent range (ref). Our study extends these findings by comparing clinical estimates both to quantitative estimates and to visual estimates made by an investigator who is also skilled in quantitative angiography techniques.

The identification of systematic differences among hospitals in the relationships between clinical and quantitative angiographic estimates would suggest the need to reexamine practice patterns and consider the merits of adopting quantitative angiography techniques as the clinical standard.

9.1.2 Specific Objectives

1. Using quantitative angiography techniques, determine the percent diameter stenosis, minimal luminal diameter, and the "normal" reference segment diameter for the most severely obstructed lesion in each coronary artery or major branch.

2. Determine the flow grade and collateral circulation for each artery examined.

3. Examine the differences between quantitative angiographic estimates of percent stenoses, clinical estimates, and visual estimates made by the study investigator (MG).

4. Examine the relationships of differences between quantitative angiographic and clinical estimates for different degrees of stenosis.

5. Examine hospital and patient factors associated with differences between quantitative and clinical estimates of the degree of stenosis.

6. Compare the characteristics of vessels that were bypassed with those that were not bypassed.

7. Evaluate the relationships between the quality of angiograms and discrepancies between clinical (venual) and quantitative angiographic estimates.

8. Evaluate the completeness of important clinical information in the catheterization reports received from participating hospitals.

9.2 Study Design

9.2.1 Patient Samples

Twenty (20) coronary angiograms were randomly sampled from among patients who were enrolled in the demonstration during 1993 at six of the seven participating hospitals. St. Lukes Hospital/Texas Heart Institute chose not to participate in the study. All patients must have received their coronary angiograms at the participating hospital but could have received it either on the same admission during which CABG surgery was performed (DRG 106) or during an earlier admission (DRG 107). Random sampling was performed from a list of eligible study participants supplied by HCFA.

Hospitals sent angiograms and copies of the clinical cardiac catheterization and surgeon's operative reports to Health Economics Research, Waltham, MA. These were logged and checked against the list of sampled patients. They were then forwarded to the Quantitative Angiography Core Laboratory at the Beth Israel Hospital, Boston, MA.

9.2.2 Quantitative Angiography Laboratory

Quantitative angiography interpretations were performed by C. Michael Gibson, M.D., Director of the Angiography Core Laboratory, and his colleagues using an automated edge detection algorithm(s). Dr. Gibson has served as the director of the TIMI 4 Angiographic Laboratory and the Angiographic Core Laboratory for the Harvard Atherosclerosis Reversibility Project (HARP) (1-14). The Beth Israel laboratory has been in operation since 1991 and has analyzed over 2,000 lesions from the U.S., and Canada.

The laboratory uses a DEC 5500 work station with software developed at the Brigham and Women's and Beth Israel Hospitals. A SONY SME 3500 projector, capable of 4-fold magnification of cineframes, was used for viewing and digitizing images.

9.3 Methods

9.3.1 Quantitative Angiography Procedures

9.3.1.1 Invoicing and Blinding Cinefilms

Cinefilms and cardiac catheterization and operative reports were invoiced as they were received by the laboratory. Cinefilms were blinded to the hospital of origin by removing the leader strip that contained identifying information and assigning a code number to both the film and leader strip. Catheterization and operative reports were also blinded.

9.3.1.2 Identifying Critical Lesions

Catheterization and surgical reports were reviewed by an angiographer to identify the location of the most critical lesion in each epicardial artery and to determine whether or not it was bypassed. A second quantitative angiographer used this information when analyzing the cinefilm. This procedure was designed to assure that the same lesions were being analyzed by quantitative angiography as had been reported in catherization reports . All cinefilms were then over-read by the Director or Associate Director of the laboratory. Results were recorded on the Angiographic Core Laboratory Worksheet (see Appendix to Chapter 9).

Analysis was limited to the most severely narrowed lesion in each major epicardial artery or branch. If several lesions were present in a given artery or branch, the one with the smallest minimum lumen diameter was selected. The left main coronary artery was routinely analyzed.

The optimal single projection was selected that showed the stenotic segment in its greatest severity without foreshortening or overlapping branches. End-diastolic frames were given preference.

9.3.1.3 Quantitative Angiography Procedures and Definitions

Appendix 9 provides a detailed description of:

- Projections and items selection;
- Definitions of Segmental Coronary Anatomy;
- Flow Grade Assessment;

- Assessment of Collateral Circulation;
- Quantitation Angiography Analysis.

9.3.1.4 Assessment of the Quality of Angiography

Each cinefilm was carefully examined and graded according to the following criteria as being excellent, good, average, or poor.

1. Uninterpretable: The primary endpoint cannot be analyzed secondary to exceedingly poor film exposure or quality (i.e. no images on the film, inadequate injection of contrast material, etc.).

2. Poor: The primary endpoint can be analyzed but the film quality is poor secondary to under or overexposure, poor panning, poor engagement, poor contrast injection, excess collimation, partial obscuration by diaphragm. The distinction between TIMI grade one and two flow is hard or impossible to make because the cinefilming is of inadequate duration to make the distinction. Injection begins before cinefilming.

3. Average: Adequate film quality. In some, but not all views, distal panning is adequate to assess TIMI flow grade. Dye is occasionally injected prior to the beginning of the cinefilming. Moderate overlap of vessels is present. Moderate obscuration of lesions by the diaphragm.

4. Good: Good film quality. During most injections there is adequate panning to assess flow to the distal vasculature and collaterals if present. Dye is not injected prior to the beginning of the cinefilming. Mild overlap of some vessels is present. Mild obscuration of lesions by the diaphragm.

5. Excellent: Excellent film quality. There is adequate panning to assess flow to the distal vasculature of the infarct-related artery and collaterals if present. Dye is not injected prior to the beginning of the cinefilming. The lesion is centered in the film during some portion of the cinerun to minimize pincushion distortion for quantitative analysis. The lesion is well layed out with no overlap of branches and orthogonal views are obtained to show the lesion in its tightest dimension.

9.3.2 Review of Cardiac Catheterization Reports

Cardiac catheterization reports were abstracted for information on the clinical indication for the angiogram, technical features of the procedure, and any complications. Variables assessed were:

- Clinical indication for coronary angiography
- Whether angiography was followed by failed angiography
- Whether an IABP had been inserted prior to angiography
- Whether vasodilators were used during the procedure
- Type and amount of contrast
- Number of catheters used
- Fluoroscopy time as a measure of radiation exposure

- Complications of the procedure

9.3.3 Clinical Data

Clinical data on sampled patients were obtained from the demonstration's core clinical database. Variables assessed were:

- Age, sex and race of the patient
- Clinical presentation at the time of hospitalization
- Revascularization priority
- History of previous CABG surgery
- Left ventricular ejection fraction
- Coronary artery anatomy
- Body surface area
- Number of conduits inserted during subsequent surgery
- Outcomes of CABG surgery: in-hospital mortality and whether a reoperation was required during the CABG surgery admission

9.4 Data Analysis

9.4.1 Specification of Variables

Primary outcomes are differences between the degrees of stenosis reported in catheterization reports versus those obtained by (1) quantitative angiography and (2) visual interpretations by the study investigator. The study investigator's own interpretations represent a "standard" for visual interpretations performed by a highly trained cardiologist not involved in the clinical process of care. A human benchmark, we believe, is an important strength of the design, as the majority of hospitals do not have access to quantitative angiography.

Variables are:

- Percent stenosis by the hospital's visual interpretation (HospVis%)
- Percent stenosis by quantitative angiography (Quant%)
- Percent stenosis by the investigator's visual interpretation (Invest%)

Each variable is explored both as a continuous and as a categorical variable.

Analyses then explore:

- the difference between the percent stenosis by the hospital's visual interpretation and the percent stenosis determined by quantitative angiography (HospVis% - Quant%)

- the difference between the percent stenosis by the hospital's visual interpretation and the percent stenosis by the quantitative angiographer's visual interpretation (HospVis%-Invest%)

- the relationship between each of these differences and the percent stenosis by quantitative angiography.

All other patient characteristics, clinical catheterization results, and quantitative angiography results are analyzed in form they were collected.

9.4.2 Descriptive Analyses

Descriptive results are presented for the total sample and by hospital for:

- the clinical characteristics of sampled patients
- information contained in the clinical catheterization reports
- quantitative angiography results

Significant differences among hospitals are analyzed by chi square analysis or t-tests as appropriate.

9.4.3 Regression Analyses

Multiple linear regressions examine patient and hospital factors associated with differences between the hospital's visual interpretation and quantitative angiographic and the investigator's visual interpretations.

Independent variables in these regressions include:

- hospital dummy variable
- patient's gender
- patient's age
- coronary artery system having the lesion
- clinical presentation of the patient at the time of the CABG surgery admission
- previous CABG surgery
- quantitative percent stenosis
- revascularization priority (emergent, urgent, or elective)

9.5 Descriptive Results

9.5.1 Clinical Characteristics of the Patient Sample

The clinical characteristics of patients in the quantitative angiography study are shown in Table 9-1. Patient samples are similar to the overall population enrolled in the Heart Bypass Demonstration during 1993 (Table 9-2) except that fewer sampled patients received elective CABG surgery (41.2 percent v. 56.8 percent); fewer had presented for their admissions with stable angina (23.5 percent v. 28.7 percent,) and more with AMI s (31.9 percent v. 24.1 percent,). In-hospital death rates were slightly higher in sample patients (5.0 percent v. 4.2 percent). A possible reason for observed differences are that patients who received their angiograms at outside hospitals were excluded from the sampling frame.

9.5.2 Catheterization Report Data

Results are presented in Table 9-3. Information on the clinical diagnosis or the indication for angiography was missing from 24 percent of reports overall and from 45 percent and 50 percent of reports, respectively, in Hospitals (IV and V). Where present, the clinical indication was stated to be stable angina in 35 percent of patients, unstable angina in 34 percent, and post-myocardial infarction in 26 percent. This proportion of patients with stable angina is higher than that reported in Table 9-1 (34 percent v. 23.5

percent). This difference may be accounted for by patients who were admitted with unstable angina which stabilized before coronary angiography.

Three patients underwent angiography with an IABP in place, and 8 patients received an angioplasty which failed and necessitated urgent CABG surgery.

One or more complications of catheterization were reported in 10 percent of patients and included cardiac arrest in 1.7 percent of patients, AMI in 1.7 percent, increased angina in 3.4 percent, and a hematoma in 2.5 percent. Those figures are almost certainly underestimates in view of the tendency to under-report complications that occur during catheterization procedures. The fact that complications such as 1 vessel angina, hematoma, or wound (puncture sites) are frequently observed after the patient leaves the catheterization laboratory is another reason for underreporting complications.

The angiographic procedure was described in varying detail in catheterization reports. Data were missing from a large number of reports, however, on certain aspects of the procedure. The type of contrast agent was missing in 63.9 percent of cases. When present, 53.5 percent reported use of (more expensive, but less allergenic) non-ionic agents, and 46.5 percent reported use of a ionic agent. The amount of contrast agent used was missing from 85 percent of reports; and the amounts reported generally referred only to bolus injections used for left ventricular angiography. Data on the types and numbers of catheters used were missing in 48 percent of cases; when present the modal number of catheters was 3. Total fluoroscopy time was recorded in only 6 percent of cases, even though radiation exposure is an important risk factor. Use of a vasodilator was reported in 11.8 percent of cases; this figure almost certainly reflects underreporting.

9.5.3 Quantitative Angiography Results

Table 9-4 describes qualitative findings. Angiographic quality was judged to be excellent in 7.6 percent of cineangiograms, good in 21 percent, and poor in 21 percent. Hospitals (IV and VI) had poor quality angiograms in 35 percent of cases. Hospital (I) had the best overall quality of angiograms (good in 40 percent, average in 55 percent and poor in 5 percent). Catheter size was 7F in 54.6 percent of cases and 6F in 35.3 percent. The right coronary circulation was dominant in 89 percent of patients.

Quantitative angiographic results are summarized in Table 9-5. Data on percent stenosis was available on all lesions in the LMCA but only to the tightest lesion in each epicardial coronary artery or branch system. Only lesions with 10 percent or greater stenosis by hospital visual estimates are reported in Table 9-5.

Analysis of 33 LMCA lesions revealed a mean stenosis of 41.1 percent and LMCA stenoses of 50 percent or greater in 42.5 percent of patients. LMCA lesions were isolated in 1.7 percent of patients and were in an ostial location in 8.5 percent of patients. Nearly all (96.6 percent) LMCA lesions were bypassed during CABG surgery.

A total of 317 lesions were examined in the left, circumflex and right coronary artery systems (LCRA). Of these, 20.5 percent represented total occlusions; 32.8 percent were of 70-99 percent stenosis; and 31.5 percent were 50-69 percent stenosis. A higher proportion of left coronary artery lesions were bypassed than in the circumflex or right systems (94.6 percent v. 80.5 percent and 81.4 percent, respectively).

9.5.4 Differences Between Quantitative Angiographic and Visual Interpretations of the Percent Stenosis

Quantitative angiographic estimates are compared to the hospitals' visual and the investigator's visual estimates in Table 9-6. In all coronary arteries, the mean percent stenosis is highest by the hospitals'

visual interpretations, and lower by quantitative angiography. The investigator's visual interpretations are intermediate but are much closer to quantitative angiography.

In the left main coronary artery, stenosis of 50 percent or more was found by quantitative angiography in 42.5 percent of lesions, in 54.6 percent by investigator visual estimates, and in 62.8 percent by hospital visual estimates. In the epicardial arteries, the proportions of lesions with 70-99 percent stenosis are 57.2 percent, 50.9 percent, and 32.8 percent, respectively, by the three techniques. Corresponding values for 40-69 percent lesions are 19.4 percent, 22.7 percent, and 41.6 percent. Hence, hospital visual estimates are substantially higher around the threshold for clinical decision-making (> or = 70 percent) and are correspondingly lower below this level. This finding is especially striking in the left coronary artery system where visual inspection "sees" much more occlusion in the 80-99 percent range.

Differences in percent stenoses between quantitative angiographic and the hospitals' visual interpretations (HospVis% - Quant%), overall and by hospital, are presented in Table 9-7. Results are based on 317 lesions in the epicardial arteries and 33 lesions in the LMCA . The overall mean differences between the hospitals' visual estimate and the quantitative estimates was 9.2 percent in epicardial arteries and 11.9 percent in the LMCA. In epicardial arteries, the distribution of differences included 45.8 percent of lesions within + or - 10 percent by the two techniques and 26.1 percent that were 20 percent or more higher by hospital visual estimates. In the LMCA, corresponding figures were 33.3 percent and 42.4 percent.

Patterns varied considerably among hospitals. Mean differences in the epicardial arteries were highest in Hospitals (I, IV, and V) (16.8 percent, 14.6 percent, and 12.6 percent, respectively) and lowest in hospital (II) (-3.4 percent). The small numbers of lesions analyzed in the LMCA prevent meaningful comparisons among hospitals.

Differences between the hospitals' visual interpretations and those by the investigator (HospVis% - InvestVis%) are presented in Table 9-8. In the epicardial arteries, the hospitals' visual estimates are higher, but the mean difference is less than for (HospVis% - Quant%) (4.6 percent v. 9.2 percent). The same hospitals exhibit extreme patterns as above. In the LMCA, the mean difference between HospVis% and InvestVis% is similar to that between HospVis% and Quant%.

Figures 9-1 and 9-2 display cumulative distributions of percent stenosis by the three measurement techniques for the LMCA and epicardial arteries, respectively. For the LMCA, the hospitals' visual estimate is the highest at every level of stenosis, though the difference from the investigator's visual estimates is small for lesions of 80 percent or greater. The quantitative angiographic estimate is lowest at every level of stenosis, and the investigator's visual estimate is intermediate. The proportion of lesions with 50 percent stenosis or greater is 27.2 percent by Quant%, 33.4 percent by InvestVis percent, and 48.6 percent for HospVis percent. Hence, more than 20 percent of patients would be deemed to have "critical" lesions by the hospital than by quantitative angiography.

Findings in epicardial arteries are similar except the difference between HospVis percent and InvestVis percent are much smaller throughout than in the case of the LMCA. The proportion of lesions with 70 percent stenosis or greater is 53.3 percent by Quant percent, 71.3 percent by InvestVis percent, and 77.5 percent by HospVis percent. The implication is that 24.2 percent more lesions would be deemed to have "critical" stenoses by the hospitals' estimates.

9.5.5 Differences Among Measurement Techniques According to the Severity of Stenosis

Tables 9-9 and 9-10 examine relationships between (HospVis percent - Quant percent) and (HospVis percent - Invest percent) , respectively, and the degree of stenosis estimated by quantitative angiography. In the epicardial arteries, hospitals' visual estimates show a graded relationship to the extent of stenosis for both comparisons. For HospVis percent - Quant percent (Table 9-9) the mean difference

falls from 25 percent when the degree of stenosis by quantitative angiography is <-40 percent, to 13.6 to 15.1 percent range when it is 40 - 69 percent, and to 8.5 percent when it is 70 - 79 percent. Differences become negative for stenoses of 80 - 99 percent indicating higher estimates by quantitative and investigator visual estimates at high levels of obstruction. Median differences followed similar patterns. For HospVis% - InvestVis% (Table 9-10) mean differences are smaller but show essentially the same trend on the LMCA, patterns are similar.

9.5.6 Decision to Bypass a Lesion Versus the Severity of Stenosis

The decision to bypass a particular lesion at the time of CABG surgery depends on the severity of the stenotic lesion by angiography or as it appears at surgery, the clinical condition of the patient, and the availability of suitable venous or arterial grafts. Though the decision is multifactored, angiographic results play a major role.

Table 9-11 presents data, overall and by hospital, on the relationship between percent stenosis and whether the lesion was bypassed in epicardial arteries. "Innocent bystander" lesions in the LAD were excluded if a LMCA lesion was bypassed.

Hospital visual interpretations are those that guide decision-making. Overall, 90 percent or more of lesions were bypassed if obstructions were 50 percent or more. Nearly two-thirds of lesions with 50-59 percent stenosis were bypassed, and 50 percent or more of lesions with less than 50 percent stenosis. Only 83 percent of totally obstructed arteries were bypassed, probably due to small distal luminal diameters or poor runoffs. Patterns varied widely among hospitals. Hospitals (II, IV, and VI) bypassed nearly all lesions, while Hospital (V) bypassed only three quarters of all lesions.

Results for quantitative angiography reflect the lower percent stenosis recorded by this technique in the range that govern clinical decision-making (40-70 percent). For example, two-thirds of lesions with stenoses of <10 percent to 49 percent by quantitative angiography were bypassed, and 89 percent of lesions with stenoses of 50-59 percent were bypassed.

9.5.7 Effects of Angiography Techniques on Differences Between Hospital Visual and Quantitative Estimates

Table 9-12 presents findings for cineangiogram quality, catheter size, and vessel diameter. The incidence of positive differences 20 percent or greater is markedly lower when the angiogram is of excellent quality compared to poor quality (12.5 percent v. 28.6 percent). Similarly, the incidence of negative differences of 11 percent or greater is also higher for this comparison (4.2 percent v. 11.2 percent). These findings persist for positive differences of 20 percent or greater when the combination of excellent plus good angiograms is compared to average plus poor angiograms (25.8 percent v. 48.6 percent) but are small for negative differences of (14.0 percent v. 16.1 percent).

Use of larger catheters (7F or 8F) appear to be associated with fewer large positive discrepancies (21.4 percent v. 33.9 percent) but more negative discrepancies (14.3 percent v. 3.3 percent) than when smaller catheters are used (5F or 6F).

The distribution of minimum luminal diameters is too skewed toward lesions of less than 2 mm to draw meaningful conclusions (233 of 256 total lesions had MLD of <2mm). An analysis distinguishing lesions of 1 mm and 2 mm is needed. Findings with respect to average luminal diameter are inconclusive. Smaller (<2mm) and larger (>=3mm) show similar patterns of positive and negative discrepancies.

9.6 Multivariate Results

Multivariate analysis-of-variance methods was used to test for differences between the stenosis estimates of cardiologists at the six demonstration hospitals and the quantitative angiography and visual estimates of the expert who reevaluated the angiographic films. Two dependent variables were constructed based on (a) the difference between the hospital's reported levels of stenosis and quantitative angiographic estimates (hospital vs. quantitative difference); and (b) the difference between the hospitals' estimates and an expert's visual estimates (hospital vs. visual investigator difference).

The primary focus of the analysis is on the extent of systematic differences between the hospital and evaluator interpretations of stenosis. In order words, does the average difference in stenosis readings vary systematically from hospital to hospital, implying that some cardiologists in facilities tend to "see" more stenosis than other sites.

Analysis-of-variance methods were used to test the null hypothesis of no systematic differences in readings across the six hospitals. Dummy variables were created for each hospital, and the percent of variance explained by the set of dummies was determined. Joint F-tests were used to determine whether the separation of the readings into six hospital sets explained a statistically significant amount of the variation. Hospital regression coefficients were estimated showing the mean absolute differences in readings between the hospital's and expert interpretations.

To allow for the possibility that systematic errors in interpretation may be affected by other patient variables, several were controlled for, including

* artery system (left, right, circumflex, or left main coronary artery);
* clinical presentation (stable angina, unstable, angina, AMI, or asymptomatic);
* admission priority (elective, urgent, emergent);
* sex (male, female);
* previous CABG;
* patient age;
* percent stenosis.

It is possible that the location of the lesion, the extent of stenosis, or other factors may affect the ability of interpreters to accurately measure the degree of stenosis. The "gold standard" for percent stenosis was the quantitative angiography reading.

Analyses of variance were conducted on all epicardial arteries as a group and then on a pooled sample that included the left main coronary artery. Two models were estimated on each dependent variable. The first analysis included all potentially confounding variables in evaluating differences across hospitals. This is the most powerful test of hospital differences since it controls for all other possible explanations of systematic differences. However, because of extensive collinearity among potentially confounding variables, it may not be possible to derive accurate estimates of the individual effects. Hence, a deleted model was run in each case based on variables found to be statistically significant (at 10%) in the complete model. The full set of hospital dummies was also included in the second model.

Table 9-13 presents the results of eight models. The first set of four models explain differences in interpretation for lesions in the epicardial arteries alone. For this analysis, complete data were available on 279 lesions. More observations were available in the reduced models due to unreported data. The second four models are based on all arteries including left main stenosis. This sample is larger and includes 309 lesions with complete data.

In Model 1 that compares the hospital's interpretation with the quantitative interpretation, Type I sums of squares (not shown) indicated that hospital site was significantly related to mean differences before

any other variables were controlled for ($F = 12.8$, $p<.01$). Type III sums of squares, however, showed a major reduction in the explanatory power of site once all other confounding factors were included. Nevertheless, site remained a highly significant predictor ($F = 5.5$, $p<.01$).

Turning to the coefficients reported in the table, *ceteris paribus*, Hospital I (in the intercept) had a mean overestimate of the degree of stenosis by 34.2 percentage points. (The overall average overestimate vs. quantitative angiography was 8.7 points.) Two hospitals exhibited significantly lower differences: Hospital II was nearly 14 points lower than Hospital I; and Hospital III was almost 8 points lower. The other three institutions were 1-4 points lower, but their difference was not statistically different from Hospital I.

Of patient-level variables, only percent stenosis was found to be significantly related to the differences between hospital and quantitative interpretations. Its coefficient of -.34 ($p<.01$) implies that every 10 percentage point increase in the degree of stenosis resulted in an improvement in hospital accuracy (relative to quantitative angiography) of 3.4 percentage points. Greater error occurred when the degree of stenosis was less. Both a squared stenosis term and categorical stenosis terms were included to test for a nonlinear relationship. The squared term was quite insignificant, implying a linear relationship throughout the relevant range of stenosis. An interaction of hospital site with percent stenosis was insignificant ($F=0.95$; $p=.45$), implying that, in general, sites did not experience different gradients with respect to degree of stenosis. If anything, hospital I showed a greater overestimate, *ceteris paribus*, allowing for different slopes by site.

Dropping all insignificant variables and rerunning the analysis of variance (see Model 2) resulted in slight increases in the differences between Hospital I (in the intercept) and the other hospitals. Hospital VI became significantly lower (-5.87 points) versus Hospital I. The stenosis coefficient was unaffected.

The results for Models 3 and 4 comparing the hospital's visual interpretation with the expert's own visual interpretation are similar. The F-tests for hospital site and percent stenosis were still significant at the 1 percent level. It should be noted, however, that the mean difference has fallen from 8.70 to 4.12 percentage points. Hospital I continues to have a relatively high overestimate of stenosis (39.40 points) compared to one other site, controlling for degree of stenosis and other factors. After insignificant variables are excluded, however, the intercept coefficient falls below its value in Model 2. Hospital II continues to understate the degree of stenosis significantly relative to Hospital I (by 10.96 points in Model 3 and 13.30 points in Model 4). Except in Model 4, Hospital III and the other three hospitals were not significantly different from Hospital I using the expert visual standard. The level of stenosis had smaller quantitative effects on the error in Models 3 and 4 but still its coefficient was quite significant. Hospital site-stenosis interactions were statistically significant ($p=.07$) but are not reported as they had no effect on the basic conclusions.

Results including the left main coronary artery are reported in Models 5-8 in Table 9-6. The results are very similar compared to those based on other arterial groups. In Model 5, Hospital I tended to overestimate the degree of stenosis by roughly 23 points. Hospital II tended to overestimate stenosis by 12 points less than Hospital I while all other hospitals overestimated by about as much as Hospital I.

According to Model 5, hospitals tended to overestimate the degree of stenosis in the epicardial arteries by 8-10 percentage points relative to the left main artery (in the intercept). The degree of stenosis continued to exhibit a highly significant, negative, relationship.

The reduced Model 6 produced only minor changes in the hospital and system coefficients. Hospital III now shows a 6.4-point (lower) difference relative to Hospital I.

Interhospital differences are reduced somewhat when the hospitals' and expert's visual estimates are compared. Hospital III no longer significantly underestimates stenosis relative to Hospital I. Limited evidence suggests Hospital VI may overestimate stenosis relative to I, although this difference disappears in

the reduced Model 8. When comparing hospital visual with investigator visual interpretations, only right artery stenosis tended to be overestimated consistently compared to the left main.

9.7 Conclusions

1. The random sample of patients whose cineangiograms were evaluated by quantitative angiography was approximately of the universe of patients operated upon in 1993 in the demonstration.

2. Many cardiac catheterization reports are incomplete with respect to clinical indications for the catheterization and data relevant to the procedure. These data may be recorded elsewhere in the patient's chart, but they need to be readily available to evaluate the risks and costs of the procedure, and, in some cases, to interpret the cineangiogram.

3. Angiographic quality was poor in a substantial (5 - 35 percent) of cases. The fact that quality of the film was associated with the magnitude of discrepancies between the hospitals' interpretations and quantitative angiographic estimates underscores the importance of greater attention to angiographic quality.

4. The hospitals' estimates of the percent stenosis are greater than quantitative angiographic estimates at all levels of stenosis in both the LMCA and epicardial arteries. Differences become smaller, however, at higher degrees of stenosis. The mean percent difference, though not the distribution of lesions among stenosis ranges, actually becomes negative in the 80-99 percent range. In epicardial arteries, 24.2 percent more lesions are classified as having "critical" stenoses of 70 percent or greater by the hospitals' interpretations than by quantitative angiography. In the LMCA, this figure for "critical" lesions greater than 50 percent is 21.4 percent.

5. Hospital visual estimates of the percent stenosis are also greater than expert visual estimates. Differences are less, however, than for quantitative angiography. In the epicardial arteries, 6.2 percent more lesions have "critical" stenoses by hospitals' estimates, and, in the LMCA, this figure is 15.2 percent.

6. Multivariate regressions find that hospital site is significantly associated with differences between hospital visual and quantitative angiographic estimates and also with differences between hospital visual and investigator visual estimates. Of the six hospitals that provided films, one systematically understated the degree of stenosis. Among the rest, three systematically overstated the degree of stenosis while two others were 5-8 points lower depending on whether a quantitative or visual gold standard was used. Percent stenosis by quantitative angiography is negatively associated with the magnitude of the difference. Overestimations of the percent stenosis are greater for epicardial lesions than they are for LMCA lesions. Other patient variables do not explain significant amounts of the variance.

Quantitative Angiography Procedure and Definitions

APPENDIX 9

QUANTITATIVE ANGIOGRAPHY PROCEDURES AND DEFINITIONS

Projection and Frame Selection

High quality angiographic projections minimize vessel foreshortening, minimize vessel overlap, and minimize motion blur. The following angiographic projections were given preference.

Left main: the anterior/posterior projection or the RAO caudal view.

Left anterior descending artery: the RAO cranial projection secondary views included the LAO cranial and the left lateral view.

Circumflex and Obtuse Marginals: the RAO caudal or LAO caudal projections.

Proximal RCA: the LAO straight projection.

Mid-RCA: the RAO straight projection or lateral projection.

PDA and Posterolateral: the AP cranial projection.

Reference was given to end-diastolic frames in the analysis, but occasionally other frames were used to minimize vessel overlap, motion blur, or foreshortening. The end-diastolic frame is defined as the frame that immediately precedes the first systolic motion of the heart. A uniform phase of the cardiac cycle is analyzed because of the large frame-to-frame variability in a cineangiogram (1).

Definitions of Segmental Coronary Anatomy

The coronary anatomy is divided into the following defined segments:

Left main (LM): extends from the origin of the left coronary artery to the bifurcation into the left anterior descending and circumflex arteries.

Proximal left anterior descending artery (L1): extends from the bifurcation of the left main coronary artery to the origin of the first diagonal.

Mid left anterior descending artery (L2): extends from the origin of the first diagonal artery to the origin of the third diagonal artery.

Distal left anterior descending artery (L3): extends from the origin of the third diagonal to the termination of the left anterior descending artery. If there is no third diagonal branch, the left anterior descending artery can be divided into three equal portions.

First diagonal artery (D1): the first branch off of the left anterior descending artery which supplies the anterolateral wall of the left ventricle.

Second diagonal artery (D2): the second branch off of the left anterior descending artery which supplies the anterolateral wall of the left ventricle. In an RAO projection, this artery often arises where the left anterior descending angles toward the apex.

First septal artery (S1): the first branch off of the left anterior descending supplying the septum. Originates in either the proximal or the mid left anterior descending artery.

Second septal artery (S2): the second branch off the left anterior descending supplying the septum. Usually originates in the mid left anterior descending artery.

Intermedius (I): an artery whose origin bisects the origins of both the left anterior descending artery and the circumflex artery. When an intermedius branch is present, the left main will be seen to trifurcate in the LAO caudal projection, and the intermedius artery is the middle artery at this point of trifurcation.

Proximal circumflex artery (C1): extends from the origin of the circumflex off of the left main to the origin of the first obtuse marginal branch.

Mid circumflex artery (C2): extends from the origin of the first obtuse marginal to the origin of the second obtuse marginal. If there is no second obtuse marginal branch, this is the first half of the circumflex artery extending past the origin of the first obtuse marginal.

Distal circumflex artery (C3): extends from the origin of the second obtuse marginal to the termination of the circumflex artery. If there is no second obtuse marginal artery, this is the distal half of the circumflex artery after the origin of the first obtuse marginal.

First obtuse marginal artery (OM1): the first branch off of the circumflex artery supplying the lateral wall of the left ventricle.

Second obtuse marginal artery (OM2): the second branch off of the circumflex artery supplying the lateral wall of the left ventricle.

Third obtuse marginal artery (OM3): the third branch off of the circumflex artery supplying the lateral wall of the left ventricle.

Left posterolateral artery (LPL): in left dominant or balanced systems this is the distal continuation of the circumflex artery. It originates before the left posterior descending artery.

Left posterior descending artery (LPDA): in left dominant or balanced systems this is the distal continuation of the left circumflex artery supplying septal perforators the base of the heart. This branch is distal to the origin of the left posterolateral, and lies to the observers left of the posterolateral branch in the LAO caudal projection.

Proximal right coronary artery (R1): extends from the ostium of the right coronary artery to the RV branch. If the RV branch is not apparent, then this is one half of the distance to the acute marginal branch.

Mid right coronary artery (R2): extends from the origin of the RV branch to the origin of the acute marginal. Alternatively, if the right coronary branch is

not obvious, this is the second half of the distance from the origin of the right coronary artery to the origin of the acute marginal branch.

Distal right coronary artery (R3): extends from the origin of the acute marginal to the origin of the posterior descending artery.

Right posterior descending artery (RPDA): in right dominant or codominant systems, this vessel runs in the posterior interventricular groove and supplies septal perforator branches.

Right posterolateral artery (RPL): this is the distal continuation of the right coronary artery after the origin of the posterior descending artery. It often has an inverted U shape as described by James. The AV nodal branch originates from this artery.

Right ventricular artery: (RV): arises from the right coronary artery approximately half way to the acute margin of the RV.

Acute marginal (AM): artery originating at the acute margin of the heart distal to the RV branch.

In the case of redo bypass surgery, the following definitions apply:

Saphenous Vein Graft to the LAD: (SVGLAD)

Saphenous Vein Graft to Circumflex: (SVGCX)

Saphenous Vein Graft to the Right Coronary Artery: (SVGRCA)

Saphenous Vein Graft to the PDA: (SVGPDA)

Saphenous Vein Graft to the Obtuse Marginal: (SVGOM)

Saphenous Vein Graft to Diagonal: (SVGD1)

Left Internal Mammary Artery to the Left anterior descending artery: (LIMA)

Flow Grade Assessment

The flow down arteries analyzed using quantitative angiography will be graded as follows:

CNA: If the flow cannot be assessed or is not available, then CNA (cannot assess) is circled. The grade flow is assessed using the following criteria:

Grade 0: No perfusion. There is no antegrade flow beyond the point of occlusion.

Grade 1: Penetration without perfusion. The contrast material passes beyond the area of obstruction but "hangs up" and fails to opacify the entire coronary bed distal to the obstruction for the duration of the cineangiographic filming sequence.

Grade 2: Partial perfusion. The contrast passes across the obstruction and opacifies the coronary bed distal to the obstruction. However, the rate of entry of contrast material into the vessel distal to the obstruction or its rate of clearance from the distal bed (or both) are perceptibly slower than its entry into or clearance from comparable areas not perfused by the previous occluded vessel-e.g., the opposite coronary artery or the bed proximal to the obstruction. This flow grade is divided into 2 "Fast" (minimal delay, approximately 60 frames to opacify the vessel) or 2 "Slow" (severely delayed, requires approximately 100 frames to opacify the vessel).

Grade 3: Complete perfusion. Antegrade flow into the bed distal to the obstruction occurs as promptly as antegrade flow into the bed proximal to the obstruction, and clearance of contrast material from the involved bed as rapid as clearance from an uninvolved bed in the same vessel or the opposite artery.

Caveats Regarding The Assessment of Flow Grade

1. If there is distal embolization of thrombotic material with no flow down the artery and an abrupt cutoff exists, then the flow is graded as 0. This is the case even if the artery is patent at the site of the original culprit.

2. In cases where the culprit artery is located at a branchpoint, the slowest flow down either branch is graded. For instance, while the LAD may have TIMI grade 2 flow, if a diagonal involved with thrombus has TIMI grade 1 flow, then the flow is graded as TIMI grade 1.

3. If the flow changes over the course of several injections performed at a given timepoint, then the slowest flow is used. The act of injection itself may promote clot dissolution, and, therefore, the injection in which flow is slowest is used.

Assessment of Collateral Circulation

The presence of collateral circulation will be graded as in previous TIMI studies:

Grade 0: No collaterals present, angiography fails to reveal evidence of collateral vessels.

Grade 1: Minimal collaterals present, evidence of minimal to partial filling of the recipient artery.

Grade 2: Well-developed collaterals. Evidence of collateral circulation with near to complete filling of the recipient artery.

Quantitation Angiography Analysis

The cineframes were optically magnified by a factor of 3. Cinefilm images were digitized as 512 X 512 X 8 bits using a digitizer interfaced to a the computer providing a spatial resolution in the imagefield of 6 to 8 pixels per millimeter. An approximation of the centerline of the arterial segment was provided by the operator, and a preliminary estimate of the arterial border was made. A series of 256 grey scale densitometric profiles characterizing the intensity

of pixels aligned or onthogonal to this centerline were generated at each pixel (representing a distance of approximately .12 to .16 millimeters) along the length of the artery in a second iteration. A fifth degree polynomial was fit to the left and the right sides of each densitometric profile, and the edge of the vessel was defined as the inflection point or the zero value of the second derivative of this expression. A second determination of the centerline was recalculated based upon this estimate of the refined vessel edge. A third iteration of the vessel border calculation was then performed based on this refined centerline.

At every pixel along the length of the vessel, the arterial diameter was calculated. The minimum arterial diameter is defined as the minimum value of a polynomial fit to the five consecutive diameters adjacent to the smallest single diameter estimate in a region of interest. The "normal" reference arterial segment diameter was defined as the average arterial diameter was defined as the average arterial diameter operator-selected portion of the vessel that appeared normal angiographically either proximal or distal to the lesion.

Data were invoiced in a paper format and placed in an Excel spreadsheet.

Angiographic Core Laboratory Reading Form

ANGIOGRAPHIC CORE LABORATORY READING FORM

Film Code #: Film Analysis Date: / /

Angiographic Study Quality: *Excellent* *Good* *Average* *Poor* *Uninterpretable*

Redo: *Y* *N* Catheter Size: 6F 7F 8F BSA:

Dominance: *Right* *Left* *Codominant*

Left Main:

Reference Diameter: MLD: % Stenosis: Average Diameter:

Bypassed: *Y* *N* Isolated LM: *Y* *N* Ostial: *Y* *N* Visual % Stenosis

Left Anterior Descending Artery System:

	Prox. LAD	Mid LAD	Distal LAD	1st Diagonal	2cd Diagonal	Ramus	S1	S2	SVG	None
Tightest Lesion										
Bypassed										
Ref. Diam										
Min. Diam										
% Stenosis										
Ave. Diam.										
Discontinuous										
Collaterals										
Thrombus										
Visual % St.										

TIMI grade flow: *0* *1* *2S* *2F* *3* *CNA* Average Vessel Diameter:

Circumflex Artery System:

Film Code Number: ____

	Prox. Cx	Mid Cx	Distal Cx	OM1	OM2	OM3	LPDA	LPL	SVG	None
Tightest Lesion										
Bypassed										
Ref. Diam.										
Min. Diam.										
% Stenosis										
Ave. Diam.										
Discontinuous										
Collaterals										
Thrombus										
Visual % St.										

TIMI grade flow: *0* *1* *2S* *2F* *3* *CNA* Average Vessel Diameter:

Right Coronary Artery System: Film Code Number:

	Prox. RCA	Mid RCA	Dist. RCA	AM1	AM2	RPDA	RPL	SVG	None
Tightest Lesion									
Bypassed									
Ref. Diam.									
Min. Diam.									
% Stenosis									
Ave. Diam.									
Discontinuous									
Collaterals									
Thrombus									
Visual % St.									

TIMI grade flow. *0* *1* *2S* *2F* *3* *CNA* Average Vessel Diameter:

Operations Manual For The Comparative Study of Computerized Versus Visual Analyses of Coronary Arteriograms Prior to Coronary Artery Bypass Grafting

C. Michael Gibson, M.S., M.D.

Objectives:

1. To determine the percent stenosis, the minimum lumen diameter, and the "normal" reference diameter of arteries that are to undergo CABG using validated automated edge detection.

2. To determine if these measurements are equally distributed among participating institutions and to compare the quantitative angiographic estimates of percent diameter narrowing with those provided by participating centers.

3. To determine if there is a relationship between the measurements of vessel size and percent diameter stenosis with subsequent adverse outcomes. This analysis would be performed with and without adjustment for BSA, the number and location of bypassed vessels, and other epidemiologic covariates such as age and sex to determine if these measurements had independent predictive value for an adverse outcome.

4. To examine vessels that did not undergo bypass surgery, and determine the vessel size and percent diameter stenosis of these vessels.

5. To determine the feasibility of routinely using quantitative angiography in the preoperative evaluation of cinefilms.

Methods:

Facilities: The West Roxbury Veterans Administration Hospital Angiographic Core Laboratory:

The Angiographic Core Laboratory has been in continuous operation since 1991. The angiographic core facility is dedicated to providing accurate and precise data in a timely fashion regarding the qualitative analysis of cinefilms such as TIMI grade flow or lesion morphology and quantitative analyses such as the absolute dimensions of arteries. The facility has an exceptional track record of collaboration in multicenter studies. With over 2,400 lesions analyzed from cinefilms sent from Canada and the United states, no cinefilms have ever been lost in any collaborative study to date.

The Angiographic Core Laboratory occupies approximately 300 square feet of dedicated space within the Division of Cardiology at the West Roxbury Veterans Administration Hospital. Adequate space is present for the storage of 500 cineangiograms within the Angiographic Core Laboratory. Films in the Angiographic Core Laboratory are not mixed with films for clinical use.

Personnel:

The Director of the Angiographic Core Laboratory is Dr. C. Michael Gibson M.S.,M.D. who has served in the past as the Director of the TIMI 4 Angiographic Core Laboratory and as the Director of the Angiographic Core Laboratory for the Harvard Atherosclerosis Reversibility Project (HARP) (1-14). Studies assessing the mechanisms of restenosis have also been conducted in the laboratory (1-14) The laboratory is staffed by one full-time technician and cardiology fellows who will perform the initial quantitative and qualitative angiographic analysis

of all incoming films. Films received in the Angiographic Core Laboratory will undergo initial review by the Angiographic Core Laboratory Technician, who will be responsible for unpacking films, invoicing the films arrival, and recording the initial readings on an Angiographic Core Laboratory Worksheet. Once a preliminary reading has been performed, the films will be overread by the Angiographic Core Laboratory Director or Associate Director.

Equipment:

The angiographic core laboratory contains a SONY SME3500 projector capable of fourfold optical magnification of cineframes which will be used for viewing and digitization of images in the study. The cinefilms will be analyzed using a DEC 5500 workstation.

Procedures for Film Handling and Blinding:

Cineangiograms, cardiac catheterization report forms and surgical reports will be submitted to the Angiographic Core Laboratory at the West Roxbury Veterans Administration Hospital, Boston MA. All cinefilm reviewers will be blinded to the identity of the institution submitting the cinefilm and the clinical outcome of the patient.

Films will be submitted in batches to the angiographic core center by an independent consulting firm, Health Economics Research. Upon film arrival at the angiographic core center, a technician who does *not* perform the quantitative angiographic analysis will remove identifying information including the patient and the submitting center name from the cinefilm. The cinefilm and the detached leader strip will both be labeled with the same randomly selected identifying code number using a black magic marker. This will eliminate any potential for bias with respect to the identity of the submitting clinical centers. The technician will review the

cardiac catheterization and operative report from the submitting center and will identify and record the location of the most critical stenosis in each epicardial artery that was bypassed as defined below. The quantitative angiographer (a physician) will then analyze the cinefilm based upon this identification of the critical bypassed lesions provided by the technician. In this way it will be assured that the quantitative angiographer is analyzing the same lesions as were bypassed by the submitting center.

Policy for film return:

In the event of an emergency, the films can be returned to the submitting clinical center by overnight mail.

Projection Selection

The cineangiograms will be initially reviewed in toto to obtain an overview of the patient's coronary anatomy and extent of coronary artery disease. A high quality angiographic projection minimizes vessel foreshortening, minimizes vessel overlap, and minimizes motion blur. The following angiographic projections are in general of high quality, and will be given preference when selecting the frames for analysis:

Left main: The anterior/posterior projection.

Left anterior descending artery: The RAO cranial projection is preferred. Secondary views include the LAO cranial and the left lateral view.

Circumflex and Obtuse Marginals: The LAO caudal or the RAO caudal projections.

Proximal RCA: The LAO straight projection.

Mid-RCA: The RAO straight projection or lateral projection.

PDA and Posterolateral: The AP cranial projection.

Frame Selection:

Once it is determined which single plane angiographic projection shows the lesion in its tightest dimension and is of the highest quality, an end diastolic frame will then be chosen for analysis. Occasionally frames other than end-diastole may be chosen as a result of vessel overlap, motion blur or foreshortening. The end-diastolic frame is defined here as that frame immediately preceding the first systolic motion of the heart. A uniform phase of the cardiac cycle is analyzed because of the large frame-to-frame variability in a cineangiogram (1).

Data intake form:

Film code: Unique random digit assigned to each patient. Range 1-120.

Film analysis date: Date that quantitative angiography was performed.

Angiographic study quality:

1. Uninterpretable:

The primary endpoint cannot be analyzed secondary to exceedingly poor film exposure or quality (i.e. no images on the film, inadequate injection of contrast material, etc.).

2. Poor:

The primary endpoint can be analyzed but the film quality is poor secondary to under or overexposure, poor panning, poor engagement, poor contrast injection, excess collimation, partial obscuration by diaphragm. The distinction between TIMI grade one and two flow is hard or impossible to make because the cinefilming is of inadequate duration to make the distinction.

3. Average:

Adequate film quality. In some, but not all views, distal panning is adequate to assess TIMI flow grade.

4. Good:

Good film quality. During most injections there is adequate panning to assess flow to the distal vasculature and collaterals if present.

5. Excellent:

Excellent film quality. There is adequate panning to assess flow to the distal vasculature of the infarct-related artery and collaterals if present. Dye is not injected prior to the beginning of the cinefilming.

Redo: yes specifies that the patient has previously undergone bypass surgery.

Catheter size:

Size of the catheter used in the procedure. Ascertained from the cardiac catheterization report. 6F=2.0 mm, 7F=2.3 mm and 8F=2.7 mm.

BSA: Body surface area ascertained from the cardiac catheterization report.

Dominance of the coronary tree: based upon the arterial system that supplies the posterior descending artery. Either right, left, or codominant.

Left main: reference diameter in mm, minimum diameter in mm, % stenosis, average diameter in mm all by quantitative angiography (for a description of this method, see below).

Left main bypassed: yes or no answer. If yes, this means that either an isolated left main lesion was bypassed, or that the left main was an "innocent bystander" as the LAD or circumflex were bypassed.

Isolated left main: yes or no response. Yes means that CABG was performed for an isolated left main lesion, and there were no significant stenoses in the LAD or Cx (i.e. less than 50% visual stenoses in the LAD and the Cx).

Left main ostial: Yes no response. Ostial means the blockage occurred within 1 mm of the origin of the artery from the aorta.

Left main visual % stenosis: Core laboratory visual reading of percent stenosis/ clinical center's reading. Range 0-100%. The word nl means 0%.

Definitions of Segmental Coronary Anatomy:

The coronary anatomy is divided into the following defined segments for identification of the bypassed artery:

Left main (LM): Extends from the origin of the left coronary artery to the bifurcation into the left anterior descending and circumflex arteries.

Proximal left anterior descending artery (L1): Extends from the bifurcation of the left main coronary artery to the origin of the first diagonal.

Mid left anterior descending artery (L2): Extends from the origin of the first diagonal artery to the origin of the third diagonal artery.

Distal left anterior descending artery (L3): Extends from the origin of the third diagonal to the termination of the left anterior descending artery. If there is no third diagonal branch, then the left anterior descending artery can be divided into three equal portions.

First diagonal artery (D1): The first branch off of the left anterior descending artery which supplies the anterolateral wall of the left ventricle.

Second diagonal artery (D2): The second branch off of the left anterior descending artery which supplies the anterolateral wall of the left ventricle. In an RAO projection, this artery often arises where the left anterior descending angles toward the apex.

First septal artery (S1): The first branch off of the left anterior descending supplying the septum. Originates in either the proximal or the mid left anterior descending artery.

Second septal artery (S2): The second branch off of the left anterior descending supplying the septum. Usually originates in the mid left anterior descending artery.

Intermedius (I): An artery whose origin bisects the origins of both the left anterior descending artery and the circumflex artery. When an intermedius branch is present, the left main will be seen to trifurcate in the LAO caudal projection, and the intermedius artery is the middle artery at this point of trifurcation.

Proximal circumflex artery (C1): Extends from the origin of the circumflex off of the left main to the origin of the first obtuse marginal branch.

Mid circumflex artery (C2): Extends from the origin of the first obtuse marginal to the origin of the second obtuse marginal. If there is no second obtuse marginal branch, then this is the first half of the circumflex artery extending past the origin of the first obtuse marginal.

Distal circumflex artery (C3): Extends from the origin of the second obtuse marginal to the termination of the circumflex artery. If there is no second obtuse marginal artery, then this is the distal half of the circumflex artery after the origin of the first obtuse marginal.

First obtuse marginal artery (OM1): The first branch off of the circumflex artery supplying the lateral wall of the left ventricle.

Second obtuse marginal artery (OM2): The second branch off of the circumflex artery supplying the lateral wall of the left ventricle.

Third obtuse marginal artery (OM3): The third branch off of the circumflex artery supplying the lateral wall of the left ventricle.

Left posterolateral artery (LPL): In left dominant or balanced systems this is the distal continuation of the circumflex artery. It originates before the left posterior descending artery.

Left posterior descending artery (LPDA): In left dominant or balanced systems this is the distal continuation of the left circumflex artery supplying septal perforators the base of the heart. This branch is distal to the origin of the left posterolateral, and lies to the observers left of the posterolateral branch in the LAO caudal projection.

Proximal right coronary artery (R1): Extends from the ostium of the right coronary artery to the RV branch. If the RV branch is not apparent, then this is one half of the distance to the acute marginal branch.

Mid right coronary artery (R2): Extends from the origin of the RV branch to the origin of the acute marginal. Alternatively, if the right coronary branch is not obvious, this is the second half of the distance from the origin of the right coronary artery to the origin of the acute marginal branch.

Distal right coronary artery (R3): Extends from the origin of the acute marginal to the origin of the posterior descending artery.

Right posterior descending artery (RPDA): In right dominant or codominant systems, this vessel runs in the posterior interventricular groove and supplies septal perforator branches.

Right posterolateral artery (RPL): This is the distal continuation of the right coronary artery after the origin of the posterior descending artery. It often has an inverted U shape as described by James. The AV nodal branch originates from this artery.

Right ventricular artery: (RV): Arises from the right coronary artery approximately half way to the acute margin of the RV.

Acute marginal (AM): Artery originating at the acute margin of the heart distal to the RV branch.

Saphenous Vein Graft to the LAD: (SVGLAD)

Saphenous Vein Graft to Circumflex: (SVGCX)

Saphenous Vein Graft to the Right Coronary Artery: (SVGRCA)

Saphenous Vein Graft to the PDA: (SVGPDA)

Saphenous Vein Graft to the Obtuse Marginal: (SVGOM)

Saphenous Vein Graft to Diagonal: (SVGD1)

Left Internal Mammary Artery to the Left anterior descending artery: (LIMA)

Tightest lesion: Will be checked off if the lesion was the tightest lesion in the coronary circulation. There may be situations where a lesion was bypassed, but it was not the tightest lesion in the LAD, cx or RCA system.

Bypassed: yes or no. We did analyze the tightest lesion in each artery whether it was bypassed or not. This will give us valuable information about arteries that were not bypassed.

Reference diameter, minimum diameter, % stenosis and average diameter: These measurements were determined by quantitative angiography. The artery to be bypassed was ascertained by review of the cardiac catheterization report, the surgical report, and the submitted cinefilm. The most severely narrowed lesion in the epicardial artery that was to undergo bypass surgery was then analyzed by quantitative angiography. If there were several epicardial stenoses with the same visual percent diameter stenosis, then the lesion analyzed was the one with the smallest minimum lumen diameter. From multiple views obtained at cardiac catheterization, the optimal single projection was selected that identified the bypassed stenosis in its greatest severity without foreshortening or overlapping branches. An end-diastolic frame was chosen for quantitative angiographic analysis. A previously described and validated automated edge detection algorithm was utilized (1). The cineframes were optically magnified by a factor of 3. The cinefilm images were digitized as 512 X 512 X 8 bits using a digitizer interfaced to a midframe computer (Digital Electronic Computers Model 5500, Maynard MA) providing a spatial resolution in the imagefield of 6 to 8 pixels per mm. An approximation of the centerline of the arterial segment was provided by the operator, and a preliminary estimate of the arterial border was then made. A series of 256 grey scale densitometric profiles characterizing the intensity of pixels aligned orthogonal to this centerline were generated at each pixel (representing a distance of approximately .12 to .16 mm) along the length of the artery in a second iteration. A fifth degree polynomial was fit to the left and the right sides of each densitometric profile, and the edge of the vessel was defined as the inflection point or the zero value of the second derivative of this expression. A second determination of the centerline was recalculated based upon this estimate of the refined vessel edge. A third iteration of the vessel border calculation was then performed based on this refined centerline.

At every pixel along the length of the vessel, the arterial diameter was calculated as above. The minimum arterial diameter was defined to be the minimum value of a polynomial fit to the five consecutive diameters adjacent to the smallest single diameter estimate in a region of interest. The "normal" reference arterial segment diameter was defined as the average arterial diameter of an operator selected portion of the vessel which appeared normal angiographically either proximal or distal to the lesion. Results are reported in mm.

Discontinuous: During a portion of the cardiac cycle, there was no dye in the lumen. Often corresponds to a visual reading of 99% stenosis.

Collateral Circulation:

The presence of collateral circulation will be graded as in previous TIMI studies:

Grade 0: No collaterals present, angiography fails to reveal evidence of collateral vessels.

Grade 1: Minimal collaterals present, evidence of minimal to partial filling of the recipient artery.

Grade 2: Well-developed collaterals. Evidence of collateral circulation with near to complete filling of the recipient artery.

TIMI Flow Grade Assessment:

CNA: If the flow cannot be assessed or is not available, then CNA (cannot assess) is circled.

The TIMI grade flow is assessed using the following criteria:

Grade 0: No perfusion. There is no antegrade flow beyond the point of occlusion.

Grade 1: Penetration without perfusion. The contrast material passes beyond the area of obstruction but "hangs up" and fails to opacify the entire coronary bed distal to the obstruction for the duration of the cineangiographic filming sequence.

Grade 2: Partial perfusion. The contrast passes across the obstruction and opacifies the coronary bed distal to the obstruction. However, the rate of entry of contrast material into the vessel distal to the obstruction or its rate of clearance from the distal bed (or both) are perceptibly slower than its entry into or clearance from comparable areas not perfused by the previous occluded vessel- e.g., the opposite coronary artery or the bed proximal to the obstruction.

Grade 3: Complete perfusion. Antegrade flow into the bed distal to the obstruction occurs as promptly as antegrade flow into the bed proximal to the obstruction, and clearance of contrast material from the involved bed as rapid as clearance from an uninvolved bed in the same vessel or the opposite artery.

Caveats regarding the assessment of TIMI flow grade:

1. If there is distal embolization of thrombotic material with no flow down the artery and an abrupt cutoff exist, then the flow is graded as 0. This is the case even if the artery is patent at the site of the original culprit.

2. In cases where the culprit artery is located at a branchpoint, *the slowest flow* down either branch is graded. For instance, while the LAD may have TIMI grade 2 flow, if a diagonal involved with thrombus has TIMI grade 1 flow, then the flow is graded as TIMI grade 1.

3. If the flow changes over the course of several injections performed at a given timepoint, then the slowest flow is used. The act of injection itself may promote clot dissolution, and therefore the injection in which flow is slowest is used.

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Appendix C

Impact of Bundled Payments on the Appropriateness of CABG Surgery

8.0 IMPACT OF BUNDLED PAYMENTS ON THE APPROPRIATENESS OF CABG SURGERY

8.1 Background and Rationale for Examining Appropriateness

Marked geographic variations in the rates of CABG surgery suggest either excessive use of the procedure in some regions of the country or underservice of other regions. The absence of convincing evidence that higher CABG surgery rates reflect higher prevalence rates of coronary artery disease lend support to the former hypothesis. (For a review of the efficiency and risks of CABG surgery, see Leape *et al.*, undated)

This concern has stimulated efforts to develop clinical guidelines(AHA/ACC Task Force Report, 1991) and appropriateness criteria for the use of CABG surgery (RAND, 1986 and 1991). Application of the first set of RAND criteria in randomly selected hospitals in a western state in 1979 - 1982 concluded that 14 percent of procedures were for inappropriate reasons and another 30 percent were for equivocal reasons (Winslow, 1988). Much lower rates of inappropriate or equivocal use (2.4 percent and 7.0 percent, respectively) were found in a recent study in New York (Leape, 1993). An important question raised by the latter study is whether New York is representative of the U.S. as a whole or has lower rates than other states because it is so highly regulated.

A comparison of CABG surgery in Canada and New York offers further insights. This study used two sets of criteria - the U.S. criteria that had been applied earlier in New York and criteria developed by expert panel of Canadian physicians using a RAND-like methodology - to compare the appropriateness of CABG surgery in the previously reported New York population to that of patients in British Columbia and Ontario (McGlynn, 1994). Using U.S. criteria, 9 percent of Canadian operations were performed for uncertain indications and 2.5 percent were inappropriate compared to 7 percent and 2.4 percent, respectively, in New York. Using Canadian criteria, equivalent figures were 11.3 percent and 3.6 percent for Canadian operations and 9.9 percent and 5.5 percent, respectively, in New York. Hence, appropriateness rates were not significantly different.

Canadian criteria, however, appeared to be more stringent than U.S. criteria. For example, as indicated by the fact that 14.9 percent of Canadian operations and 15.4 percent of New York operations were judged to be uncertain or inappropriate by the Canadian criteria compared to only 11.5 percent and 9.4 percent by U.S. criteria. The Canadian physicians who rated the appropriateness of clinical indications for CABG surgery appear to have had a more conservative mindset than their U.S. counterparts.

The rationale for examining the appropriateness of CABG surgery in the Heart Bypass Center Demonstration grew both from concerns about the appropriateness of surgery being performed under the Medicare program in general, and, in particular, about possible adverse effects of incentives created by bundled payments to increase rates of marginally indicated procedures.

8.2 Specific Objectives

Specific objectives are to:

1. Examine the appropriateness of CABG surgery in demonstration hospitals at baseline;

2. Document any changes in the appropriateness of CABG surgery in response to bundled payments;

3. Document differences among hospitals in the appropriateness of CABG surgery and patterns of change during the demonstration and to examine patient, hospital, and market factors that explain these differences.

Baseline estimates provide evidence that hospitals selected to participate in the demonstration were, in fact, adhering to normative standards. Changes during the period of the demonstration may indicate either industry-wide changes in clinical indications for CABG surgery due to changes in technology or practice norms or may reflect the effects of incentives created by bundled payments. Hospital-specific differences in response may reflect internal or market area influences.

8.3 Methods for Rating Appropriateness

The methods used follow closely those developed by the RAND Corporation (Leape *et al.*, 1991; Chassin *et al.*, 1986) . Steps in developing our appropriateness model included: (1) review of published literature on the effectiveness of CABG surgery; (2) development of a matrix of clinical indications; (3) rating of the appropriateness of clinical indications by an expert Technical Advisory Panel; and (4) calculation of appropriateness scores for clinical indications.

8.3.1 Review of the Literature on CABG Surgery

Nearly 700 studies on the effectiveness, risks, and costs of CABG surgery published between 1971 and 1990 were read, abstracted, and synthesized (Leape *et al.*, 1991). This extensive review, coupled with a more targeted review prepared by Lewin/ICF, served as a foundation for developing a matrix of clinical indications for CABG surgery and provided the technical advisory panel with an up-to-date summary of available scientific evidence. In reviewing the literature and developing the list of clinical indications, care was taken to focus on bypass surgery exclusive of other major cardiac procedures.

8.3.2 Clinical Indications for CABG Surgery

Clinical indications for CABG surgery were developed using the patient's clinical presentation, coronary artery disease anatomy, left ventricular ejection fraction (LVEF), anginal level, comorbidity risk, prior medical therapy, and exercise stress test results as defining variables. The goal was that each indication represented a subpopulation of patients with coronary artery disease that was relatively homogeneous with respect to the benefits and risks of treatment.

Indications were organized into chapters according to the clinical presentation: stable angina, unstable angina, acute myocardial infarction, post myocardial infarction, asymptomatic patients with coronary artery disease, near sudden death, complications of PTCA or coronary angiography, and CABG performed in conjunction with valve surgery.

Within each chapter, indications were arrayed according to the:

- extent of coronary artery disease (left main, 3 vessel disease, 2 vessel disease with or without involvement of the left anterior descending artery (LAD), and 1 vessel disease with or without LAD involvement.
- left ventricular ejection fraction categories
- anginal class (I or II NYHA, III or IV NYHA)
- adequacy of prior medical therapy (maximal, less than maximal)
- exercise stress test (ETT) results (negative or minimally positive, strongly positive)
- comorbidity risk (low, moderate, high)

Key definitions underlying clinical indications include:

- Significant coronary artery disease represents a 50 percent or greater reduction in the luminal diameter of left main coronary artery and a 70 percent or greater reduction in the luminal diameter of other coronary arteries.

- Adequate medical therapy includes at least two categories of anti-anginal drugs or one drug and a note in the record that the patient cannot tolerate the others.

- Comorbidity risk from age, sex, and non-cardiac diseases was defined initially by a modified Parsonnet score (Leape, 1991).

- Left ventricular ejection fraction, anginal class, and ETT results from definitions widely used in the medical literature (Leape, 1991).

8.3.3 Technical Advisory Panel

A technical advisory panel of experts in cardiovascular surgery, invasive and non-invasive cardiology, and general internal medicine was formed to provide appropriateness ratings on clinical indications for CABG surgery. The TAP was selected from lists of individuals recommended by their respective specialty societies supplemented by authors of key articles and recommendations from other experts. The goal was to appoint a panel of 6 to 9 members with at least 2 representatives of each discipline. A representative from a payor organization was added at the request of HCFA's Office of Research and Demonstrations. Nine panelists plus a payor representative were selected, but only 8 completed the entire rating process. Two panelists had to withdraw, one because of illness and the other because of a scheduling conflict. The final panel included 3 cardiovascular surgeons, 2 invasive cardiologists, 2 non-invasive cardiologists/internists and a payor representative.

8.3.4 Appropriateness Ratings

Clinical indications were rated using a modified delphi process. First, the literature reviews and clinical indications matrix were mailed to the panel. Panelists were asked to read the reviews and then to rate appropriateness of clinical procedures for an average patient described by each indication. Ratings were on a scale of 1 to 9 in which a 9 indicated that the procedure was extremely appropriate; a rating of 1 indicated that it was extremely inappropriate; and a rating of 5 indicated neutrality or uncertainty. Each patient scenario was rated three times: (1) for CABG surgery if the patient is not candidate for PTCA; (2) for CABG surgery if the patient is a candidate for PTCA; and (3) for PTCA compared to medical therapy.

Appropriateness was defined in terms of the balance between the expected health benefits (longevity and quality of life) and risks compared to the alternative therapy. For example, a rating of 9 indicated a high degree of certainty that the net benefits (benefits minus risks) of CABG surgery greatly exceeded those of the alternative therapy; a rating of 5 indicated either a certainty that benefits equaled risks or considerable uncertainty about the relationship; and a rating of 1 indicated a high degree of certainty that the net benefits of the alternative therapy greatly exceeded those of CABG surgery.

This initial set of ratings was analyzed and distributed during a two day meeting of the panel held in January, 1991. Each panelist received his/her own ratings and the anonymous ratings of other panelists. Group discussion first focused on recently published studies and studies in progress that addressed controversies on the relative merits of CABG surgery and PTCA in patients with 2VD or 3VD; interventions after AMI; and treatment of patients who have experienced a near "sudden death" event. The group felt strongly that appropriateness estimates should be revised in 2-3 years to incorporated the results of ongoing studies.

Discussion then proceeded chapter-by-chapter to consider the reasonableness of the clinical indications and the definitions of clinical factors used to construct them. Several changes were made to the clinical indications and definitions used in the RAND study (Leape, 1991) and during the initial rating round in this study:

LVEF categories were changed to >50, 25-50, and <25 from >35, 15-35, <15.

Unstable angina: (1) the distinction between maximal and less than maximal therapy was eliminated for patients with continuing symptoms; (2) "no symptoms on maximal medical therapy" was changed to "stabilized on medical therapy".

Acute myocardial infarction: the use of thrombolysis was added as a defining characteristic.

Post myocardial infarction: the distinction between transmural and subendocardial infarctions was dropped in patients who are asymptomatic after MI.

Near sudden death: This subgroup generated considerable controversy. The decision was made to eliminate distinctions based on anatomy, LVEF, angina level, and ETT results and to limit ratings to a single indication for patients "without a Q-wave infarction, with any level of angina, anatomy, and LVEF."

Following the discussion of each chapter, clinical indications were re-rated. A total of 828 clinical indications were rated during the second round. Each was rated for the three treatment pairs noted above for a total of 2484 ratings by each panelist.

8.3.5 Calculation of Appropriateness Scores

Methods developed by RAND were used to analyze ratings (Chassin, 1986). The median value of the eight panelists was used as the measure of central tendency for each unique indication, and the mean absolute distance of ratings from the median was used as the measure of dispersion. The degree of agreement among the panelists is a measure of the confidence one can place in median ratings. Agreement (A) is defined by having all ratings within a 3 point spread after the highest and lowest ratings were eliminated. Disagreement (D) is defined by having at least one rating fall in the 1-3 range and one reading in the 7-9 range after the highest and lowest ratings have been eliminated. Intermediate (I) levels of agreement are those between these extremes.

An indication is considered "**appropriate**" if the median rating is 7 to 9; "**equivocal or uncertain**" if it is 4 to 6; or "**inappropriate**" if it is 1 to 3. Furthermore, an indication is equivocal if there is disagreement, regardless of the median rating.

The proportion of agreements increased from 22.6 percent in the initial round of ratings to 38.5 percent in the second round. Correspondingly, disagreements fell from 27.1 percent to 15.0 percent. Agreements were least frequent and disagreements most frequent in patients being treated after myocardial infarctions.

The final appropriateness ratings and scores are given in Appendix 8.A.

8.4 Analysis of Appropriateness in the Demonstration

8.4.1 Construction of the Appropriateness Analytic File

Appropriateness scores were assigned to each demonstration patient using four clinical factors. Several assumptions were made with regard to clinical information that was either missing from the clinical database or could not be determined reliably. Appropriateness scores were calculated under two treatment decision scenarios: patient is not a candidate for PTCA, and patient is a candidate for PTCA.

8.4.1.1 Clinical Factors

Clinical presentation Patients were categorized with a presentation of stable angina, unstable angina, AMI, or asymptomatic for the admission during which the CABG surgery was performed.

Anatomic extent of disease Left main disease, 3-vessel disease, 2-vessel with left anterior descending (LAD) involvement, 2-vessel without LAD involvement, 1-vessel with LAD involvement, and 1-vessel without LAD involvement.

Left ventricular ejection fraction Patients were placed in the following groups: ejection fraction less than 25 percent, ejection fraction greater than or equal to 25 percent and less than 50 percent, and ejection fraction greater than or equal to 50 percent.

Comorbidity Risk This was defined using the results from a multivariate logistic regression of a set of comorbid risk dummy variables on in-hospital mortality from the first two years of data for the original four sites. The independent comorbid variables in the model were emergent presentation, congestive heart failure, diabetes, renal insufficiency, age 73-79, age 80 and over, female gender, previous CABG surgery, and pre-operative use of an intra-aortic balloon pump. The mean predicted risk score was approximately .05; a patient was categorized as low risk if his predicted risk was less than or equal to the mean, as moderate risk if his score was greater than the mean but less than or equal to twice the mean, and as high risk if his score was greater than twice the mean.

8.4.1.2 Assumptions

Several variables included in the appropriateness model were not consistently and reliably available in our database, requiring some assumptions regarding patient characteristics. These assumptions are outlined below.

Stable Angina: Angina is broken down in the appropriateness model into the subcategories "patient has severe angina" and "patient has mild or moderate angina," and is given separate treatment. Since our data provide no means of distinguishing degrees of angina severity, all patients categorized with a clinical presentation of stable angina are assumed to have severe angina. This assumption could possibly result in a set of appropriateness scores higher than might otherwise be observed.

Within the purview of severe angina patients, the model is broken down further into the categories "on maximal medical therapy" and "on less than maximal medical therapy." Patients receiving more than two medications were defined as being on maximal medical therapy.

Unstable Angina: This category is broken down in the appropriateness model into the subcategories "persistent symptoms on medical therapy" and "no symptoms on medical therapy." All unstable angina patients were assumed to have persistent symptoms on medical therapy. This assumption further errs on the side of a higher appropriateness score.

Myocardial Infarction: The appropriateness model gives separate treatment to evolving AMIs and post-AMIs (AMI within 21 days). All AMI patients in this analysis are categorized as post-AMI. The model breaks down the post-AMI category further into the subcategories "patient has continuing pain," "patient is asymptomatic with very positive exercise ETT," and "patient is asymptomatic with negative to minimally positive exercise ETT." All patients were assumed to have continuing pain. Again, this assumption would tend to overstate the appropriateness score.

8.4.1.3 Patients Excluded from the Analysis Because of Missing Data

Reasons for exclusions from the appropriateness analysis, overall and by hospital, are presented in Table 8-1. Overall, 909 of 4,158 patients (21.9%) were excluded. Reasons for exclusions were:

- patients were missing data on clinical presentation at the time of the CABG surgery admission;
- patients had stable angina, or were asymptomatic, and were missing ETT results;
- patients were missing data on the extent of disease; and
- patients were missing data on LVEF and not excluded for any of the above reasons.

The proportion of excluded patients ranged from 8% in Hospital D to 66% in Hospital G. Reasons for exclusion also varied widely by hospital. Missing exercise test results, responsible for the exclusion of almost all asymptomatic patients, were the main reason for exclusion in Hospitals B and F. Missing left ventricular ejection fractions were the main reasons for exclusions in Hospitals C and G. Missing information on coronary artery anatomy was a frequent reason for exclusion only in Hospital B.

8.4.1.4 Treatment Decisions

Appropriateness scores were calculated for two treatment scenarios: CABG surgery for a patient who is not a candidate for PTCA, and CABG surgery for a patient who is a candidate for PTCA. The national trend was to broaden indications for PTCA over the period of the

demonstration (1991-1993). Hence, the former of these treatment options becomes increasingly likely over this period. The analysis, however, focuses on the appropriateness scores calculated under the assumption that the patient is not a candidate for PTCA. This produces an upward bias in appropriate scores, but none of the clinical records allowed us to distinguish the two possibilities.

8.4.2 Appropriateness Outcome Measures

Summary measures of CABG surgery appropriateness include the percent of total cases that are appropriate, equivocal, or inappropriate, as well as a mean appropriateness score. The former reflects the RAND methodology and permits comparisons to other published reports. The latter requires the assumption that the 1 to 9 rating scale is a continuous variable. There is no obvious reason that net benefits of CABG surgery (effectiveness minus risk) cannot be characterized as a continuous variable. The mean score, therefore, is a measure of the total net benefits provided to Medicare patients.

8.5 Descriptive Results

8.5.1 Characteristics of Included v. Excluded Patients

Characteristics of included and excluded patients are compared, overall and by hospital, in Table 8-2. Age, sex, and race distributions were not significantly different, but large differences are noted on several variables that define the appropriateness model. Included patients have much higher proportions of patients with:

- unstable angina (50.8% v. 29.6%) and post MI (25.2% v. 18.6%);
- DRG 106 (48.8% v. 19.9%)
- congestive heart failure (14.3% v. 9.1%); and
- LMD (23.5 v. 16.4%) and three vessel disease (47.1% v. 34.5%).

Each of these factors importantly influences the risks and benefits of CABG surgery and, hence, the decision to do surgery. Differences in patterns among hospitals are striking.

The large numbers of excluded patients, differences in the clinical characteristics of included and excluded patients, and differences in patterns among hospital markedly affect appropriateness results. This is particularly true for hospitals with high proportions of excluded patients.

8.5.2 Percent of Appropriate Cases

Table 8-3 presents the distributions of CABG operations between appropriate, equivocal and inappropriate rating categories by hospital and time period. Over the entire period of the demonstration, 72.7% of cases were judged to appropriate if the patient were a candidate for PTCA, and 97.7 % were appropriate if the patient were not a candidate for PTCA. These findings reflect strong preferences for the less invasive PTCA procedure in patients with two or single vessel disease if coronary lesions are suitable for angioplasty.

Marked differences are noted among hospitals. When the patient is not a candidate for PTCA, the proportion of appropriate cases is above 97% in Hospitals A-E but is only 86.5% in Hospital F and 79.5% in Hospital G. Results in the latter two hospitals need to be interpreted with caution, however, because of high rates of excluded cases (41.3% and 66.4%, respectively). Findings are similar if the patient is a candidate for PTCA, but the entire scale is moved downward about 20% in terms of the proportion of appropriate CABG procedures.

No time trend is evident among the initial demonstration sites between 1991 and 1993.

Table 8-4 examines appropriateness according to the patient's clinical presentation for the hospital admission during which CABG surgery was performed. The chronic stable angina group accounts for the largest proportion of equivocal or inappropriate cases whether or not the patient is a candidate for PTCA. The effect is much more dramatic, however, when the patient is a candidate for PTCA. In this case, 20.8% of cases, overall, are performed for equivocal reasons and 4.8% of cases are inappropriate. Corresponding figures range among hospitals from 7.7% to 79.2% for equivocal indications and from 0% to 19.2% inappropriate procedures.

Equivocal or inappropriate CABG operations are infrequent in patients with unstable angina or post-AMI in patients who are not candidates for PTCA. They become much more frequent, however, if the patient is a candidate for PTCA. Part of the reason relates to the less invasive nature of PTCA and its relatively lower risk in these high-risk patients. Overall, 18.1% and 4.2% of procedures, respectively, are performed for equivocal or inappropriate indications in patients with unstable angina; and 37.3% and 1.7%, respectively, in patients who post-AMI. These results vary strikingly among hospitals.

Table 8-5 offers insights into the association between appropriateness of CABG operations and the extent of coronary artery disease. If the patient is not a candidate for PTCA, 98% or more of cases are appropriate if the patient has left-main disease (LMD), three vessel disease, or two vessel disease with involvement of LAD. This proportion falls to 93.8% in two vessel disease without LAD involvement and to 91.9% and 69.9%, respectively, in one vessel disease with and without LAD involvement.

Effects of anatomy are much more dramatic if the patient is a candidate for PTCA. Over 99% of patients are appropriate candidates for surgery if LMD is present and 85.4% if three vessel disease is present. With less extensive disease, however, many fewer CABG operations are judged to be appropriate. In two vessel disease with LAD, 50.6% of cases are appropriate and 49.4% are equivocal. In two vessel disease without LAD, 88.7% of cases are equivocal and 11.3% are inappropriate. In one vessel disease with LAD, corresponding figures are 91.3% and 8.7%; and in one vessel disease without LAD, 91.3% of procedures are inappropriate.

8.5.3 Mean Appropriateness Scores

Mean appropriateness scores provide summative measure of the extent to which expected benefits exceed the risks of CABG surgery in a hospital's program. In a very real sense, the score can be considered a report card for clinical decision-making in the institution.

Table 8-6 presents mean scores overall and for individual hospitals from 1991-1993. For all years and all hospitals, scores were highly appropriate (mean 8.55) when patients were not candidates for PTCA and about a point lower (mean 7.23) when they were candidates for PTCA. Time trend was observed over the 1991-1993 period for the initial four sites. The three hospitals that entered the demonstration in 1993 had lower mean scores under all scenarios than the initial sites. In Hospitals E and F, mean scores reached the equivocal range (6.34 and 5.92, respectively) when patients were not candidates for PTCA.

Table 8-7 verifies the findings of the percent appropriate analysis presented in Section 8.5.2 with respect to the influence of the patient's clinical presentation on appropriateness scores. Mean scores are lowest for stable angina when the patient is not a candidate for PTCA. When the patient is a candidate for PTCA, mean scores are 1 to 1.5 points lower. The effect is most pronounced in the post-MI group in which the overall mean score borders on the equivocal range at 6.9. Hospitals F and G generally have lower scores than the other hospitals. This finding is especially pronounced in patients who present with chronic stable angina.

Table 8-8 presents mean scores according to the extent of coronary artery disease. Again, results mirror those of the percent appropriateness analysis. Scores are highest in patients with left main and three and two vessel disease and are lowest in patients with single vessel disease in the absence of LAD involvement. The effects of the extent of disease are especially pronounced if the patient is a candidate for PTCA. In this case, mean scores for patients with two vessel disease with or without LAD involvement or single vessel disease with LAD involvement fall in the equivocal range (6.7, 4.7, 5.0, respectively); those with single vessel disease and no LAD involvement are in the inappropriate range (mean 2.7).

8.6 Multivariate Appropriateness Results

8.6.1 Rationale

A key focus of the appropriateness analysis is on the question of whether or not bundled payments induced providers to change clinical indications for performing CABG surgery. Multivariate regressions are used to examine the independent effects of hospital and time trends in appropriateness scores. Since no pre-demonstration data are available, there is no period of comparison. Our analysis of time trends during the demonstration requires the assumption that bundled payments would result in no immediate changes in clinical indications for surgery.

8.6.2 Regression Methods

Two multivariate approaches were used to assess the time trend in appropriateness of CABG surgery: ordinary least-squares (OLS) regression on the appropriateness score, and logistic regression on a dichotomous variable that is equal to one if the CABG surgery is deemed to be inappropriate or equivocal.

The (OLS) regression model is specified as follows:

$$App_i = f[Hosp_{ih}; Time_i] \qquad (1)$$

where App_i is the appropriateness score for the ith patient, $Hosp_{ih}$ is a vector of dummy variables representing 3 of the four original demonstration hospitals, and $Time_i$ is a time trend variable indicating the month during which the CABG surgery took place (equal to 1 if the surgery took place in the first month of the demonstration, 20 if it took place during the twentieth month, etc.). No patient risk factors are included in this model due to the fact that they were used in the construction of the appropriateness score. Least-squares estimation is an obvious choice for time trend analysis of the 1 to 9 appropriateness variable, given an assumption that the appropriateness score can be considered a continuous variable. But with so little variation in the pool of appropriateness scores, and with the interpretational problems inherent in judging small inter-hospital differences in mean appropriateness, it was felt that another approach should be employed as well, one that would specifically address the question of whether or not a CABG surgery was performed appropriately. A time trend coefficient in a regression on a dichotomous dependent variable such as "appropriate" versus "not appropriate" addresses more directly our interest in changes in the number of cases that are inappropriate or

equivocal, rather than simply addressing small variations in the scores among "appropriate" cases.

The logistic model is specified as:

$$P[NotApp_i] = g[Hosp_i; Time_i] \qquad (2)$$

where $P[NotApp_i]$ is the probability that the ith patient will have a rating of either equivocal or inappropriate (these cases will be referred to as "non-appropriate" cases). A discussion of logistic regression and the interpretation of logistic odds ratios is provided in Chapter 7 of this report. OLS and logistic regression is performed using appropriateness scores for both non-PTCA candidates and for PTCA candidates.

8.6.3 Least-Squares Regression Results on Appropriateness Score

Table 8-9 reports OLS regression results using data from the original four demonstration hospitals. The new sites were excluded because only a single year of data were available for them. A table reporting regressions using non-PTCA candidate data from all seven hospitals was created, however, and can be found in Appendix 8-B. Separate regressions were run for the pooled group of all patients; for each clinical presentation (except asymptomatic patients, for whom there were little appropriateness data available); and for different extent of disease categories. Hospital D, the site with the highest mean appropriateness score, is the referent site. The intercept term in each regression represents the estimated mean for Hospital D, evaluated during the first month of the demonstration. Each hospital's dummy coefficient represents the shift in mean appropriateness associated with that hospital relative to Hospital D. The time trend coefficient is an estimate of the change in the mean appropriateness scores during each succeeding month of the demonstration.

The assumption that patients are not PTCA candidates results not just in higher mean scores, but also in mean scores that vary to a lesser extent by clinical presentation and extent of disease. The intercept value for the pooled group of patients is 8.79 under the non-PTCA candidate assumption, and 7.43 under the PTCA candidate assumption. Mean scores under both assumptions tend to diminish with lesser extents of disease, though dramatically so for PTCA candidates. A non-PTCA candidate at Hospital D with 1-vessel disease without LAD involvement has a mean score of 7.95, while an otherwise-similar PTCA candidate has a score of 2.97.

The overall model shows that under the assumption that the demonstration patients are not candidates for PTCA, Hospitals A, B and C all have mean appropriateness scores that are

significantly lower than the referent. None of these differences, however, necessarily suggests that any of the sites have poor appropriateness scores. Compared to an intercept coefficient of 8.79, Hospitals A, B and C have coefficient estimates of -.22, -.09, and -.29, respectively. Even Hospital C, the site with the greatest negative coefficient, appears comfortably in the "appropriate" range (8.79 - .29 = 8.50). Under the assumption that these patients are candidates for PTCA, only Hospital B has a mean score significantly lower than that of the referent (-0.19, $p<.10$). The time trend for the pooled group is insignificant under both assumptions, indicating that no systematic change occurred in overall appropriateness scores.

No significant time trend or hospital differences are seen among chronic stable angina patients under the assumption that they are not PTCA candidates. There is, however, significant upward trend under the opposite assumption (0.014, $p<.05$), albeit one beginning from an intercept value below the minimum "appropriate" value of 7.

Unstable angina patients show a significant downward trend in appropriateness under the assumption that they are not PTCA candidates. It is important to note, however, that this small downward trend -.005 ($p<.01$) occurs only in this cohort of unstable patients for whom the mean appropriateness score is particularly high; the intercept term of 8.93, representing the mean score for Hospital D's unstable angina patients evaluated early in the demonstration, is substantially greater than the intercepts in the other presentation group regressions (8.19 and 8.42 for chronic stable angina and AMI, respectively). And the trend is of such a small magnitude (-.005) that even during the later months of the demonstration, the estimated mean score would still fall within the "appropriate" range. Evaluated in the last month of the demonstration, the estimate of Hospital D's mean score is 8.77 (8.93 - .005*32). No significant time trend is found under the PTCA candidate assumption.

Hospitals A and B show small but significant differences in appropriateness relative to Hospital D for unstable angina patients assumed not to be PTCA candidates. The hospital dummy variables are jointly significant at the 1 percent level of confidence, and all hospital coefficients have negative signs. The appropriateness score for Hospital A's unstable patient group is .18 points ($p<.01$) lower on average than that for Hospital D, and B's is .11 points ($p<.05$) lower. These very small differences, evaluated even in conjunction with the downward trend, are clinically insignificant, as all sites maintain a mean score greater than 8 (again assuming patients are not a candidate for PTCA). Hospital C's appropriateness score is not significantly different from Hospital D's. No significant hospital differences are present among chronic stable angina or AMI patients.

Regressions run by the extent of coronary artery disease anatomy on the non-PTCA candidate score show negative time trends that are significant for patients with left main (-.003, $p<.10$), 3-vessel (-.006, $p<.01$), and 2-vessel with left anterior descending (LAD) artery disease

(.005, p<.10). Under the PTCA candidate assumption, only 3-vessel disease shows a significant downward trend (-0.013, p<.01). 3-vessel disease shows significant and large hospital differences as well, under both assumptions. Mean scores for PTCA candidates at Hospitals A, B and C, evaluated at the end of the demonstration, approach the lower boundary of the appropriate range.

The only non-PTCA candidate patients to which the regression analysis suggests mean scores below the "appropriate" range (7-9) are 1-vessel disease without LAD involvement patients at Hospital A. Hospital A's coefficient is a robustly significant -1.99 (p<.01) despite the small sample (N=91). Starting with the intercept of 7.95, Hospital A's mean score, controlling for time, is 5.96. This is in the range deemed to be "equivocal." Under the PTCA candidate assumption, however, several classes of patients appear to have mean scores below the "appropriate" range. 1-vessel without LAD patients are actually estimated to be "inappropriate" CABG cases.

The principal finding of the OLS regression analysis is that there is no significant time trend in appropriateness among the pooled group of patients, regardless of the assumption made with regard to PTCA. Certain patient subgroups show a significant downward trends in appropriateness score, but these trends are not clinically important.

8.6.4 Logistic Regression Results on Inappropriate or Equivocal Surgery

Table 8-10 reports odds ratios and p-values for two logistic regression models predicting the likelihood of a patient being either equivocal or inappropriate. Actual regression coefficients are not reported, as they are not directly interpretable (see Chapter 7). The first model includes only an intercept term and hospital dummy variables, with Hospital C now the referent. The second model adds a monthly time trend. As in the OLS analysis, patient risk factors were omitted.

The time trend is insignificant under both PTCA assumptions. Patients undergoing surgery during later periods of the demonstration were no more likely to be non-appropriate cases than those undergoing surgery earlier. The inclusion of the trend variable has little effect on the hospital dummy coefficients. The only significant hospital differences in the likelihood of non-appropriate surgery are seen under the non-PTCA candidate assumption. Hence, patients at Hospital B are less than half as likely to receive non-appropriate CABG surgery than are patients at Hospital C (odds ratio .44, p=.02). The odds ratio for Hospital D is marginally significant (odds ratio .36, p slightly greater than .10). These odds ratios appear to validate in part the hospital-difference findings in the OLS analysis. While the referent hospitals are

different in the two analyses, Hospital D appears to stand out as having a particularly high level of appropriateness score, and a low probability of non-appropriate surgery.

8.6.5 Time Trend Regression Analysis Summary

While certain classes of patients appear to have a downward trend in their mean appropriateness scores, the trend is quite minor and is not present when evaluating the pooled group of all patients under either PTCA assumption. There is no significant trend in the proportion of CABG patients who are categorized as undergoing inappropriate or equivocal surgery. While the appropriateness scores under the PTCA candidate assumption are relatively low, and in some cases not "appropriate," this assumption is not likely to be a valid one. All the demonstration sites in the regression analysis are fully capable of angioplasty, and there is no reason to believe they would not use it for those cases in which it can be used. For this reason, the "not a candidate for PTCA" assumptions is the more reasonable one.

TABLE 8-1

DATA FIELDS RESPONSIBLE FOR MISSING APPROPRIATENESS SCORES, BY HOSPITAL

Missing Variable	Hospital A	B	C	D	E	F	G	Total
Clinical Presentation	14	36	0	1	27	7	1	86
Exercise Test *	21	182	18	1	4	55	18	372
Disease Anatomy	19	167	0	0	14	9	1	239
Ejection Fraction	21	69	115	26	6	0	77	212
Missing Appropriateness Scores	75	454	133	28	51	71	97	909
As Percent of Total N	13%	26%	15%	8%	20%	41%	66%	22%

Note: These numbers represent those missing data fields responsible for the exclusion of a patient record from the appropriateness analysis. They do not necessarily correspond perfectly to the total number of fields for that variable. For example, ejection fraction is missing in the clinical dataset for over twice as many records as the 212 reported here, but many of those records missing ejection fraction were also missing another variable value, such as clinical presentation. See text.

* Exercise test was not a relevant data field for every record. The number reported here represents the number cases in which it was both relevant and missing.

Source: Abstracts of clinical records among the seven demonstration hospitals, May 1991 through December 1993. Appropriateness data are from a panel of experts.

TABLE 8-2

CLINICAL CHARACTERISTICS OF PATIENTS INCLUDED IN THE APPROPRIATENESS ANALYSIS AND THOSE EXCLUDED DUE TO MISSING DATA

	Hospital A		B		C		D		E		F		G		Total	
	INC	MISS	INC	MISS	INC	MISS	INC	MISS	INC	MISS	INC	MISS	INC	MISS	INC	MISS
Age																
Less than 65	7.7	2.7	9.8	8.6	4.5	8.3	14.5	10.7	7.7	5.9	6.9	1.4	0.0	0.0	8.2	6.5
65-74	59.8	62.2	64.9	65.6	66.8	62.4	61.1	64.3	65.2	62.7	63.4	63.4	75.5	69.1	64.3	64.8
75-84	30.6	35.1	24.9	25.6	27.8	27.8	22.3	25.0	26.6	31.4	28.7	33.8	24.5	30.9	26.5	28.2
85 or Older	1.9	0.0	0.4	0.2	0.9	1.5	2.0	0.0	0.5	0.0	1.0	1.4	0.0	0.0	0.9	0.4
Sex																
Male	60.5	70.7	66.5	66.2	69.3	74.4	63.3	71.4	67.1	70.6	70.3	70.4	81.6	69.1	66.3	68.8
Female	39.5	29.3	33.5	33.8	30.7	25.6	36.7	28.6	32.9	29.4	29.7	29.6	18.4	30.9	33.7	31.2
Race																
White	96.3	97.8	96.4	95.4	97.1	96.9	97.4	96.4	86.0	82.4	81.2	81.7	93.8	93.8	95.5	93.7
Non-White	3.7	2.2	3.6	4.6	2.9	3.1	2.6	3.6	14.0	17.6	18.8	18.3	6.3	6.3	4.5	6.3
Clinical Presentation																
Chronic Stable Angina	30.1	45.9	4.1	9.6	53.9	83.5	8.9	11.1	13.0	20.8	67.3	75.0	49.0	33.3	23.8	32.4
Unstable Angina	54.7	34.4	64.1	36.4	26.3	10.5	78.6	85.2	38.2	45.8	12.9	6.3	4.1	19.8	50.8	29.6
AMI	14.4	18.0	31.8	19.6	19.8	6.0	12.5	0.0	48.8	33.3	19.8	7.8	46.9	40.6	25.2	18.6
Asymptomatic	0.8	1.6	0.0	34.4	0.0	0.0	0.0	3.7	0.0	0.0	0.0	10.9	0.0	6.3	0.1	19.3
DRG																
106	42.2	33.3	41.0	17.3	56.4	41.4	65.8	10.7	54.1	33.3	62.4	38.0	57.1	57.3	48.8	19.9
107	61.0	66.7	59.0	82.7	43.6	58.6	34.2	89.3	45.9	66.7	37.6	62.0	42.9	42.7	51.2	80.1

TABLE 8-2 (continued)

CLINICAL CHARACTERISTICS OF PATIENTS INCLUDED IN THE APPROPRIATENESS ANALYSIS AND THOSE EXCLUDED DUE TO MISSING DATA

	Hospital															
	A		B		C		D		E		F		G		Total	
	INC	MISS	INC	MISS	INC	MISS	INC	MISS	INC	MISS	INC	MISS	INC	MISS	INC	MISS
Revascularization Priority																
Elective	75.9	57.4	51.9	90.1	29.1	42.9	37.1	87.9	85.4	96.0	86.1	86.0	67.3	68.0	57.9	76.6
Urgent	20.1	29.3	5.8	0.2	60.4	51.1	54.8	5.0	6.3	2.0	4.0	7.0	28.6	16.5	29.6	14.0
Emergent	4.0	13.3	42.3	9.7	10.4	6.0	8.1	7.1	8.3	2.0	9.9	7.0	4.1	15.5	12.5	9.4
Previous CABG	8.3	10.7	10.1	6.4	9.3	16.9	4.8	12.5	31.4	12.1	11.9	15.5	85.7	46.7	11.6	16.2
Congestive Heart Failure	27.4	17.3	12.1	10.6	11.9	10.5	8.9	3.6	15.5	9.8	14.9	2.8	0.0	0.0	14.3	9.1
Renal Insufficiency	11.2	1.8	15.5	11.5	4.9	5.5	10.0	7.1	10.1	7.8	5.0	4.2	2.0	0.0	11.0	7.9
Diabetes	29.6	31.7	24.9	24.9	30.1	29.0	30.7	39.3	30.4	25.5	28.7	9.9	26.5	24.7	27.9	25.2
Stroke	12.5	14.3	8.6	7.3	8.7	10.7	10.2	14.3	10.1	2.0	7.9	7.0	0.0	0.0	9.5	8.2
Comorbid Risk																
Low	65.8	72.0	72.6	80.6	79.6	74.4	83.7	67.9	59.9	82.4	74.3	77.5	20.4	37.1	72.7	73.8
Medium	20.5	16.0	15.2	13.2	13.8	18.8	8.3	17.9	20.3	7.8	18.8	19.7	44.9	33.0	15.9	16.7
High	13.6	12.0	12.2	6.2	6.6	6.8	8.0	14.3	19.8	9.8	6.9	2.8	34.7	29.9	11.3	9.5
Disease Anatomy																
Left Main	25.0	14.0	25.7	27.6	23.6	3.6	15.3	14.3	27.1	33.3	16.8	5.7	0.0	1.0	23.5	16.4
3-Vessel	50.5	25.6	42.2	36.6	48.7	7.1	51.1	42.9	50.7	50.0	37.6	2.9	91.8	61.5	47.1	34.5
2-Vessel with LAD	16.5	46.5	19.6	20.7	15.9	72.6	23.6	35.7	15.9	6.7	13.9	65.7	4.1	28.1	17.9	34.9
2-Vessel without LAD	3.8	7.0	3.7	4.7	2.3	13.1	1.6	0.0	2.9	6.7	1.0	25.7	0.0	5.2	3.0	7.5
1-Vessel with LAD	2.7	7.0	4.9	7.3	5.9	2.4	6.4	7.1	2.4	0.0	21.8	0.0	4.1	0.0	5.3	4.4
1-Vessel without LAD	1.5	0.0	3.9	3.0	3.6	1.2	1.9	0.0	1.0	3.3	8.9	0.0	0.0	4.2	3.2	2.4
Ejection Fraction																
Less than 25	2.7	4.0	2.2	4.3	0.8	0.0	1	0.0	4.8	12.0	20.8	23.9	6.1	0.0	2.6	6.0
25-49	31.1	32.0	39.6	37.3	69.6	72.5	30.4	0.0	37.2	16.0	18.8	18.3	63.3	42.9	44.1	40.8
50 or Greater	66.2	64.0	58.2	58.4	29.6	27.5	68.7	100.0	58	72.0	60.4	57.7	30.6	57.1	53.3	53.2

Source: Abstracts of clinical records among the seven demonstration hospitals, May 1991 through December 1993. Appropriateness data are from a panel of experts.

TABLE 8-3

PERCENT APPROPRIATE, EQUIVOCAL AND INAPPROPRIATE BY HOSPITAL BY YEAR

	Hospital							
	A	B	C	D	E	F	G	Total
Patient is Not a PTCA Candidate								
1991 (May-December)								
Appropriate	96.9	99.3	97.0	100.0				98.3
Equivocal	2.3	0.7	3.0	0.0				1.6
Inappropriate	0.8	0.0	0.0	0.0				0.1
Percent Missing Data	5.2	31.1	23.4	9.5				22.9
1992								
Appropriate	99.5	98.6	96.7	99.1				98.3
Equivocal	0.5	1.4	3.3	0.9				1.7
Inappropriate	0.0	0.0	0.0	0.0				0.0
Percent Missing Data	8.7	33.1	16.5	8.2				22.7
1993								
Appropriate	97.1	98.8	98.1	98.5	98.6	86.1	79.6	97.0
Equivocal	2.9	1.2	1.9	1.5	1.4	11.9	20.4	2.9
Inappropriate	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.1
Percent Missing Data	19.7	16.8	9.5	7.7	19.8	41.3	66.4	21.0
Total All Years								
Appropriate	97.9	98.9	97.4	99.0	98.6	86.2	79.5	97.7
Equivocal	1.9	1.2	2.6	1.0	1.5	11.9	20.5	2.3
Inappropriate	0.2	0.0	0.0	0.0	0.0	2.0	0.0	0.1
Percent Missing Data	12.6	26.2	14.6	8.2	19.8	41.3	66.4	21.9
Patient is a PTCA Candidate								
1991 (May-December)								
Appropriate	73.4	74.6	68.7	85.1				74.2
Equivocal	21.9	21.1	24.4	14.9				21.3
Inappropriate	4.7	4.3	6.9	0.0				4.5
Percent Missing Data	5.2	31.1	23.4	9.5				22.9
Total 1992								
Appropriate	76.7	70.6	76.6	80.4				74.5
Equivocal	21.7	24.8	19.4	16.1				21.8
Inappropriate	1.6	4.7	4.0	3.6				3.8
Percent Missing Data	8.7	33.1	16.5	8.2				22.7
Total 1993								
Appropriate	72.5	73.6	76.5	76.5	65.2	49.5	40.8	71.0
Equivocal	26.0	23.0	20.5	20.5	33.8	37.6	57.1	25.6
Inappropriate	1.5	3.5	3.0	3.0	1.0	12.9	2.0	3.4
Percent Missing Data	19.7	16.8	7.7	7.7	19.8	41.3	66.4	21.0
Total								
Appropriate	74.3	72.8	79.9	79.9	65.2	49.5	40.8	72.7
Equivocal	23.4	23.2	17.6	17.6	33.8	37.6	57.1	23.6
Inappropriate	2.3	4.1	2.6	2.6	1.0	12.9	2.0	3.7
Percent Missing Data	12.6	26.2	8.2	8.2	19.8	41.3	66.4	21.9

Note: Percentages appropriate, equivocal, and inappropriate are calculated from the set of records for which appropriateness scores are available.
Percentage may not sum to 100 due to rounding.
The reported percentage missing is the proportion of all records within each category which were missing one or more of the component pieces of data needed to calculate an appropriateness score.

Source: Abstracts of clinical records among the seven demonstration hospitals, May 1991 through December 1993.
Appropriateness data are from a panel of experts.

TABLE 8-4

PERCENT APPROPRIATE, EQUIVOCAL AND INAPPROPRIATE CABG OPERATION BY HOSPITAL BY CLINICAL PRESENTATION

	Hospital A	Hospital B	Hospital C	Hospital D	Hospital E	Hospital F	Hospital G	Total
Patient is Not a Candidate for PTCA								
Chronic Stable Angina								
Appropriate	97.5	94.2	96.9	92.9	96.3	79.4	62.5	94.1
Equivocal	1.9	5.8	3.1	7.1	3.7	17.6	37.5	5.6
Inappropriate	0.6	0.0	0.0	0.0	0.0	2.9	0.0	0.4
Missing Approp. Data	15.1	43.5	21.0	9.7	15.6	41.4	57.1	25.6
Unstable Angina								
Appropriate	99.3	99.1	99.5	99.6	100.0	100.0	100.0	99.3
Equivocal	0.7	0.9	0.5	0.4	0.0	0.0	0.0	0.7
Inappropriate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Missing Approp. Data	6.9	15.6	6.4	8.6	12.2	23.5	90.5	12.9
AMI								
Appropriate	94.7	98.8	96.1	100.0	98.0	100.0	95.7	97.8
Equivocal	5.3	1.2	3.9	0.0	2.0	0.0	4.3	2.2
Inappropriate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Missing Approp. Data	12.8	16.7	4.9	0.0	7.3	20.0	62.9	15.7
Patient is a Candidate for PTCA								
Chronic Stable Angina								
Appropriate	75.8	86.5	78.9	71.4	77.8	54.4	16.7	74.4
Equivocal	21.7	7.7	17.2	28.6	22.2	26.5	79.2	20.8
Inappropriate	2.5	5.8	3.8	0.0	0.0	19.1	4.2	4.8
Missing Approp. Data	15.1	43.5	21.0	9.7	15.6	41.4	57.1	25.6
Unstable Angina								
Appropriate	76.1	76.9	80.9	83.7	69.6	46.2	100.0	77.7
Equivocal	21.4	17.8	15.2	13.0	27.8	53.8	0.0	18.1
Inappropriate	2.5	5.4	3.9	3.3	2.5	0.0	0.0	4.2
Missing Approp. Data	6.9	15.6	6.4	8.6	12.2	23.5	90.5	12.9
AMI								
Appropriate	64.0	62.7	59.7	61.5	58.4	35.0	60.9	61.0
Equivocal	34.7	36.0	35.1	38.5	41.6	65.0	39.1	37.3
Inappropriate	1.3	1.2	5.2	0.0	0.0	0.0	0.0	1.7
Missing Approp. Data	12.8	16.7	4.9	0.0	7.3	20.0	62.9	15.7

Source: Abstracts of clinical records among the seven demonstration hospitals, May 1991 through December 1993. Appropriateness data are from a panel of experts.

TABLE 8-5

PERCENT APPROPRIATE, EQUIVOCAL AND INAPPROPRIATE CABG OPERATION BY HOSPITAL BY EXTENT OF DISEASE

	Hospital							
	A	B	C	D	E	F	G	Total
Patient is a Candidate for PTCA								
Left Main								
Appropriate	98.5	99.7	100.0	100.0	100.0	100.0	N/A	99.6
Equivocal	1.5	0.3	0.0	0.0	0.0	0.0	N/A	0.4
Inappropriate	0.0	0.0	0.0	0.0	0.0	0.0	N/A	0.0
Percent Missing Data	4.4	16.2	1.6	7.7	15.2	10.5	100.0	10.5
3-Vessel								
Appropriate	99.6	99.8	98.9	99.4	97.1	97.4	80.0	98.7
Equivocal	0.4	0.2	1.1	0.6	2.9	2.6	20.0	1.3
Inappropriate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percent Missing Data	1.5	13.6	1.6	7.0	12.5	2.6	56.7	11.0
2-Vessel with LAD								
Appropriate	98.8	100.0	100.0	98.6	100.0	100.0	100.0	99.7
Equivocal	1.2	0.0	0.0	1.4	0.0	0.0	0.0	0.3
Inappropriate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percent Missing Data	18.9	16.1	33.2	11.9	5.7	62.2	93.1	24.7
2-Vessel without LAD								
Appropriate	90.0	97.9	83.3	100.0	100.0	100.0	N/A	93.8
Equivocal	10.0	2.1	16.7	0.0	0.0	0.0	N/A	6.2
Inappropriate	0.0	0.0	0.0	0.0	0.0	0.0	N/A	0.0
Percent Missing Data	13.0	19.0	37.9	0.0	25.0	90.0	100.0	29.7
1-Vessel with LAD								
Appropriate	92.9	93.7	95.7	95.0	100.0	77.3	50.0	91.9
Equivocal	7.1	6.3	4.3	5.0	0.0	22.7	50.0	8.1
Inappropriate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percent Missing Data	17.6	21.3	4.2	9.1	0.0	0.0	0.0	12.2
1-Vessel without LAD								
Appropriate	50.0	84.0	60.7	100.0	100.0	11.1	N/A	69.9
Equivocal	37.5	16.0	39.3	0.0	0.0	66.7	N/A	27.2
Inappropriate	12.5	0.0	0.0	0.0	0.0	22.2	N/A	2.9
Percent Missing Data	0.0	12.3	3.4	0.0	33.3	0.0	100.0	11.2

TABLE 8-5 (continued)

PERCENT APPROPRIATE, EQUIVOCAL AND INAPPROPRIATE CABG OPERATION BY HOSPITAL BY ANATOMY OF DISEASE

	Hospital							
	A	B	C	D	E	F	G	Total
Patient is Not a Candidate for PTCA								
Left Main								
Appropriate	98.5	99.7	100.0	100.0	100.0	100.0	N/A	99.6
Equivocal	1.5	0.3	0.0	0.0	0.0	0.0	N/A	0.4
Inappropriate	0.0	0.0	0.0	0.0	0.0	0.0	N/A	0.0
Percent Missing Data	4.4	16.2	1.6	7.7	15.2	10.5	100.0	10.5
3-Vessel								
Appropriate	81.4	88.2	89.7	93.1	70.5	86.8	44.4	85.4
Equivocal	18.6	11.8	10.3	6.9	29.5	13.2	55.6	14.6
Inappropriate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percent Missing Data	4.0	13.6	1.6	7.0	12.5	2.6	56.7	11.0
2-Vessel with LAD								
Appropriate	52.3	50.6	52.8	71.6	15.2	0.0	0.0	50.6
Equivocal	47.7	49.4	47.2	28.4	84.8	100.0	100.0	49.4
Inappropriate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percent Missing Data	18.9	16.1	33.2	11.9	5.7	62.2	93.1	24.7
2-Vessel without LAD								
Appropriate	0.0	0.0	0.0	0.0	0.0	0.0	N/A	0.0
Equivocal	85.0	91.5	83.3	100.0	83.3	100.0	N/A	88.7
Inappropriate	15.0	8.5	16.7	0.0	16.7	0.0	N/A	11.3
Percent Missing Data	13.0	19.0	37.9	0.0	25.0	90.0	100.0	29.7
1-Vessel with LAD								
Appropriate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Equivocal	92.9	92.1	95.7	90.0	100.0	81.8	50.0	91.3
Inappropriate	7.1	7.9	4.3	10.0	0.0	18.2	50.0	8.7
Percent Missing Data	17.6	21.3	4.2	9.1	0.0	0.0	0.0	12.2
1-Vessel without LAD								
Appropriate	0.0	0.0	0.0	0.0	0.0	0.0	N/A	0.0
Equivocal	0.0	14.0	3.6	0.0	50.0	0.0	N/A	8.7
Inappropriate	100.0	86.0	96.4	100.0	50.0	100.0	N/A	91.3
Percent Missing Data	0.0	12.3	3.4	0.0	33.3	0.0	100.0	11.2

Source: Abstracts of clinical records among the seven demonstration hospitals, May 1991 through December 1993. Appropriateness data are from a panel of experts.

TABLE 8-6

MEAN APPROPRIATENESS OF CABG SURGERY SCORES AND STANDARD ERRORS BY HOSPITAL BY PERIOD

	Hospital A		Hospital B		Hospital C		Hospital D		Hospital E		Hospital F		Hospital G		Total	
	Mean	Standard Error	Mean	Standard Error	Mean	Standard Error	Mean	Standard Error	Mean	Standard Error	Mean	Standard Error	Mean	Standard Error	Mean	Standard Error
Patient Is Not a Candidate for PTCA																
1991																
May-Dec	8.5	0.1	8.7	0.0	8.5	0.1	8.9	0.1							8.6	0.0
1992																
Jan-June	8.6	0.1	8.7	0.0	8.5	0.1	8.9	0.1							8.6	0.0
July-Dec	8.6	0.1	8.6	0.1	8.5	0.1	8.7	0.1							8.6	0.0
Total 1992	**8.6**	**0.0**	**8.6**	**0.0**	**8.5**	**0.0**	**8.8**	**0.1**							**8.6**	**0.0**
1993																
Jan-June	8.5	0.1	8.6	0.0	8.4	0.1	8.6	0.1	8.5	0.1	8.0	0.3	8.0	0.3	8.5	0.0
July-Dec	8.6	0.1	8.7	0.0	8.5	0.0	8.7	0.1	8.5	0.1	7.9	0.2	7.6	0.2	8.5	0.0
Total 1993	**8.5**	**0.1**	**8.6**	**0.0**	**8.4**	**0.0**	**8.6**	**0.1**	**8.5**	**0.1**	**7.9**	**0.1**	**7.7**	**0.2**	**8.5**	**0.0**
Total All Years	**8.5**	**0.0**	**8.7**	**0.0**	**8.5**	**0.0**	**8.8**	**0.0**	**8.5**	**0.1**	**7.9**	**0.1**	**7.7**	**0.2**	**8.6**	**0.0**
Patient Is a Candidate for PTCA																
1991																
May-Dec	7.3	0.1	7.3	0.1	7.1	0.1	7.7	0.2							7.3	0.1
1992																
Jan-June	7.5	0.1	7.2	0.1	7.3	0.1	7.5	0.2							7.3	0.1
July-Dec	7.4	0.1	7.1	0.1	7.5	0.1	7.5	0.2							7.3	0.1
Total 1992	**7.5**	**0.1**	**7.2**	**0.1**	**7.4**	**0.1**	**7.5**	**0.1**							**7.3**	**0.1**
1993																
Jan-June	7.3	0.1	7.3	0.1	7.3	0.1	7.3	0.2	7.1	0.3	5.7	0.5	6.3	0.4	7.2	0.1
July-Dec	7.4	0.1	7.4	0.1	7.4	0.1	7.4	0.2	7.2	0.1	6.5	0.2	5.8	0.3	7.2	0.1
Total 1993	**7.3**	**0.1**	**7.3**	**0.1**	**7.4**	**0.1**	**7.3**	**0.1**	**7.2**	**0.1**	**6.4**	**0.2**	**5.9**	**0.2**	**7.2**	**0.0**
Total All Years	**7.4**	**0.1**	**7.3**	**0.0**	**7.3**	**0.1**	**7.5**	**0.1**	**7.2**	**0.1**	**6.4**	**0.2**	**5.9**	**0.2**	**7.3**	**0.0**

Source: Abstracts of clinical records among tha seven demonstration hospitals, May 1991 through December 1993.
Appropriateness data are from a panel of experts.

TABLE 8-7

MEAN APPROPRIATENESS OF CABG SURGERY SCORES AND STANDARD ERRORS BY CLINICAL INDICATION BY HOSPITAL

	Hospital A	Hospital B	Hospital C	Hospital D	Hospital E	Hospital F	Hospital G	Total
Chronic Stable Angina								
Not PTCA Candidate								
Mean	8.3	8.1	8.3	8.2	8.3	7.5	7.2	*8.2*
Standard Error	0.1	0.1	0.0	0.1	0.1	0.2	0.2	*0.0*
PTCA Candidate								
Mean	7.4	7.4	7.4	7.2	7.4	6.2	5.7	*7.2*
Standard Error	0.1	0.2	0.1	0.3	0.2	0.3	0.3	*0.0*
Observations	185.0	92.0	529.0	31.0	32.0	116.0	56.0	*1041.0*
Missing Observations	28.0	40.0	111.0	3.0	5.0	48.0	32.0	*267.0*
Unstable Angina								
Not PTCA Candidate								
Mean	8.7	8.7	8.8	8.9	8.6	8.7	9.0	*8.8*
Standard Error	0.0	0.0	0.0	0.0	0.1	0.2	0.0	*0.0*
PTCA Candidate								
Mean	7.5	7.4	7.5	7.6	7.5	6.9	8.0	*7.5*
Standard Error	0.1	0.1	0.1	0.1	0.2	0.4	0.5	*0.0*
Observations	306.0	974.0	218.0	269.0	90.0	17.0	21.0	*1895.0*
Missing Observations	21.0	152.0	14.0	23.0	11.0	4.0	19.0	*244.0*
AMI								
Not PTCA Candidate								
Mean	8.5	8.6	8.5	8.5	8.4	8.7	8.1	*8.5*
Standard Error	0.1	0.0	0.1	0.1	0.1	0.1	0.2	*0.0*
PTCA Candidate								
Mean	7.0	6.9	6.9	6.8	6.9	6.6	6.0	*6.9*
Standard Error	0.2	0.1	0.1	0.3	0.2	0.2	0.3	*0.1*
Observations	86.0	490.0	162.0	39.0	109.0	25.0	62.0	*973.0*
Missing Observations	11.0	82.0	8.0	0.0	8.0	5.0	39.0	*153.0*

Source: Abstracts of clinical records among the seven demonstration hospitals, May 1991 through December 1993. Appropriateness data are from a panel of experts.

TABLE 8-8

MEAN APPROPRIATENESS OF CABG SURGERY SCORES AND STANDARD ERRORS BY EXTENT OF DISEASE AND HOSPITAL

	Hospital							
	A	B	C	D	E	F	G	Total
Left Main								
Not PTCA Candidate								
Mean	8.8	8.8	8.9	8.9	8.8	8.9	N/A	8.9
Standard Error	0.0	0.0	0.0	0.0	0.1	0.1	N/A	*0.0*
PTCA Candidate								
Mean	8.8	8.8	8.9	8.9	8.8	9.0	N/A	8.9
Standard Error	0.0	0.0	0.0	0.0	0.1	0.0	N/A	*0.0*
Observations	136	394	186	52	66	19	1	*854*
Missing Observations	6	64	3	4	10	2	1	*90*
3-Vessel								
Not PTCA Candidate								
Mean	8.5	8.7	8.4	8.8	8.4	8.2	7.8	*8.6*
Standard Error	0.0	0.0	0.0	0.0	0.1	0.1	0.1	*0.0*
PTCA Candidate								
Mean	7.4	7.5	7.4	8.0	6.8	7.2	6.1	*7.4*
Standard Error	0.1	0.0	0.0	0.1	0.1	0.1	0.2	*0.0*
Observations	274	626	384	172	120	39	104	*1719*
Missing Observations	11	85	6	12	15	1	59	*189*
2-Vessel with LAD								
Not PTCA Candidate								
Mean	8.5	8.6	8.5	8.6	8.3	8.6	7.0	*8.6*
Standard Error	0.1	0.0	0.1	0.1	0.1	0.2	0.0	*0.0*
PTCA Candidate								
Mean	6.6	6.6	7.0	6.6	6.4	6.6	4.0	*6.7*
Standard Error	0.1	0.1	0.1	0.1	0.2	0.2	0.0	*0.0*
Observations	106	299	184	84	35	37	29	*774*
Missing Observations	20	48	61	10	2	23	27	*191*
2-Vessel without LAD								
Not PTCA Candidate								
Mean	8.2	8.4	8.1	8.9	8.3	9.0	N/A	*8.3*
Standard Error	0.2	0.1	0.3	0.1	0.3	0.0	N/A	*0.1*
PTCA Candidate								
Mean	4.7	4.8	4.6	5.0	4.7	5.0	N/A	*4.7*
Standard Error	0.2	0.1	0.2	0.0	0.3	0.0	N/A	*0.1*
Observations	23	58	29	5	8	10	5	*138*
Missing Observations	3	11	11	0	2	9	5	*41*
1-Vessel with LAD								
Not PTCA Candidate								
Mean	8.3	8.5	8.0	8.5	8.2	7.3	6.0	*8.1*
Standard Error	0.2	0.1	0.1	0.2	0.3	0.2	1.5	*0.1*
PTCA Candidate								
Mean	5.2	4.9	5.4	5.0	5.2	4.8	3.5	*5.0*
Standard Error	0.3	0.1	0.1	0.2	0.1	0.3	1.0	*0.1*
Observations	17	80	48	22	5	22	2	*196*
Missing Observations	3	17	2	2	0	0	0	24
1-Vessel without LAD								
Not PTCA Candidate								
Mean	6.0	7.1	6.8	8.0	7.5	4.7	N/A	*6.8*
Standard Error	0.7	0.2	0.2	0.0	0.5	0.6	N/A	*0.1*
PTCA Candidate								
Mean	2.4	2.8	2.7	3.0	3.3	1.8	N/A	*2.7*
Standard Error	0.3	0.1	0.1	0.0	0.3	0.2	N/A	*0.1*
Observations	8	57	29	6	3	9	4	*116*
Missing Observations	0	7	1	0	1	0	4	*13*

Source: Abstracts of clinical records among the seven demonstration hospitals, May 1991 through December 1993. Appropriateness data are from a panel of experts.

TABLE 8-9

ORDINARY LEAST-SQUARES REGRESSION RESULTS OF APPROPRIATENESS SCORE

		BY CLINICAL PRESENTATION			EXTENT OF DISEASE					
	Overall (N=2889)	Chr. Stable Angina (N=654)	Unstable Angina (N=1554)	AMI (N=675)	Left Main (N=689)	3-Vessel (N=1340)	2-Vessel with LAD (N=533)	2-Vessel without LAD (N=89)	1-Vessel with LAD (N=142)	1-Vessel without LAD (N=91)
Not PTCA Candidate										
INTERCEPT	8.79 ***	8.19 ***	8.93 ***	8.42 ***	8.96 ***	8.91 ***	8.73 ***	8.85 ***	8.49 ***	7.95 ***
HOSPITAL A	-0.22 ***	0.10	-0.18 ***	0.04	-0.12 *	-0.27 ***	-0.18 *	-0.69	-0.15	-1.99 ***
HOSPITAL B	-0.09 **	-0.08	-0.11 **	0.11	-0.08	-0.06	-0.01	-0.46	-0.01	-0.86
HOSPITAL C	-0.29 ***	0.07	-0.02	0.06	0.01	-0.38 ***	-0.12	-0.80 *	-0.51 **	-1.17 *
TREND	-0.002	0.000	-0.005 ***	0.001	-0.003 *	-0.006 ***	-0.005 *	0.002	-0.001	0.002
R-Square	0.020	0.004	0.015	0.002	0.019	0.073	0.015	0.060	0.075	0.095
Pr>F	0.000	0.463	0.001	0.787	0.011	0.000	0.128	0.184	0.015	0.037
PTCA Candidate										
INTERCEPT	7.43 ***	6.88 ***	7.64 ***	6.57 ***	8.97 ***	8.20 ***	6.71 ***	5.03 ***	5.00 ***	2.97 ***
HOSPITAL A	-0.09	0.30	-0.14	0.24	-0.15 **	-0.58 ***	0.02	-0.33	0.27	-0.61 **
HOSPITAL B	-0.19 *	0.33	-0.15	0.21	-0.08	-0.45 ***	0.02	-0.20	-0.07	-0.20
HOSPITAL C	-0.13	0.25	-0.10	0.25	-0.02	-0.56 ***	0.39 ***	-0.45	0.44 **	-0.31
TREND	0.002	0.014 **	-0.003	0.008	-0.003	-0.013 ***	-0.006	-0.001	-0.003	0.002
R-Square	.002	.007	.001	.003	.015	0.04	.037	.025	.088	.061
Pr>F	.238	.766	.633	.841	.025	0.00	.000	.540	.005	.155

NOTES:

***Indicates significance at the .01 level, ** at the .05 level, and * at .10.

The Pr>F statistic tests the joint significance of the Hospital dummy variables.

SOURCE: Abstracts of clinical records among seven demonstration hospitals, May, 1991 through December, 1993. Appropriateness data are from a panel of experts.

TABLE 8-10

LOGISTIC RESULTS ON EQUIVOCAL AND INAPPROPRIATE CABG SURGERY

	Patient is Not a PTCA Candidate				Patient is a PTCA Candidate			
	Model 1		Model 2		Model 3		Model 4	
	Odds Ratio	P-Value	Odds Ratio	P-Value	Odds Ratio	P-Value	Odds Ratio	P-Value
INTERCEPT	0.03 ***	.00	0.03 ***	.00	0.32 ***	.00	0.33 ***	.00
HOSPITAL A	0.82	.59	0.79	.54	1.08	.58	1.07	.59
HOSPITAL B	0.45 **	.02	0.44 **	.02	1.16	.15	1.16	.15
HOSPITAL D	0.37	.11	0.36 *	.10	0.78	.13	0.79	.15
TREND	-	-	0.99	.44	-	-	1.00	.85
No. Observations	2,892		2,890		2,892		2,890	
Overall Chi-Square (p-value)	7.22	.07	7.79	.10	7.53	.06	7.29	.12

*** Indicates significance at the .01 level, ** at the .05 level, * at .10.

* The numbers reported here are odds ratio, not regression coefficients (see text). An odds ratio less than 1 represents a negative relationship between the independent and dependent variables.

SOURCE: Abstracts of clinical records among seven demonstration hospitals, May, 1991 through December, 1993. Appropriateness data are from a panel of experts.

Matrix of Appropriateness Scores by Clinical Indication

KEY TO INTERPRETING FINAL APPROPRIATENESS RATINGS


```
+--------------------------------+
|                                |
|      Appropriateness Scale     |
|      ----------------------    |
|        1 2 3 4 5 6 7 8 9       |
|                                |
| 1 = extremely inappropriate    |
| 5 = equivocal (neither clearly |
|     appropriate nor clearly    |
|     inappropriate)             |
| 9 = extremely appropriate      |
|                                |
+--------------------------------+
```

	Rating of Appropriateness (Circle One)	Indication number
I. Chronic Stable Angina		
A. CABS is indicated despite the presence of strong contraindications	4 1 1 2 3 4 5 6 7 8 9 (1.0, 0.2,)	(1)
B. CABS is indicated in patients (without strong contraindications) with left main disease, and		
1. Ejection fraction 20% or greater	1 7 1 2 3 4 5 6 7 8 9 (9.0, 0.1, A)	

The number of panelists assigning each rating; in this case, 7 panelists assigned a rating of 9 and one assigned a rating of 8.

The 1-9 rating scale

The median of the 9 panelists' ratings.

The mean absolute deviation from the median; a measure of dispersion.

"A" indicates that the panelists agreed, "D" indicates that they disagreed, and a blank indicates that they neither agreed nor disagreed; all according to our preferred definitions of agreement and disagreement given in the text.

Chapter 1

CHRONIC STABLE ANGINA

	NORMAL OR LOW RISK			MODERATELY HIGH RISK			VERY HIGH RISK			
	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	
PATIENT HAS SEVERE ANGINA (CLASS III, IV)										
A. ON MAXIMAL MEDICAL THERAPY										
1. Left main disease										
a. Ejection fraction >50%	1 7 1 2 3 4 5 6 7 8 9 (9.0, 0.1, A)	1 7 1 2 3 4 5 6 7 8 9 (9.0, 0.1, A)	2 1 1 1 2 1 1 2 3 4 5 6 7 8 9 (4.5, 2.0, I)	1 7 1 2 3 4 5 6 7 8 9 (9.0, 0.1, A)	1 7 1 2 3 4 5 6 7 8 9 (9.0, 0.1, A)	2 1 2 1 2 1 2 3 4 5 6 7 8 9 (4.0, 1.6, I)	1 4 3 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	1 1 5 1 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	1 1 1 4 1 1 2 3 4 5 6 7 8 9 (5.0, 1.4, I)	(1- 9)
b. Ejection fraction 25-49%	1 7 1 2 3 4 5 6 7 8 9 (9.0, 0.1, A)	1 7 1 2 3 4 5 6 7 8 9 (9.0, 0.1, A)	2 1 1 1 2 1 1 2 3 4 5 6 7 8 9 (4.5, 2.0, I)	1 7 1 2 3 4 5 6 7 8 9 (9.0, 0.1, A)	1 7 1 2 3 4 5 6 7 8 9 (9.0, 0.1, A)	2 1 2 1 2 1 2 3 4 5 6 7 8 9 (4.0, 1.6, I)	2 3 3 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	1 1 5 1 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	1 1 1 4 1 1 2 3 4 5 6 7 8 9 (5.0, 1.4, I)	(10- 18)
c. Ejection fraction <25%	2 6 1 2 3 4 5 6 7 8 9 (9.0, 0.2, A)	2 6 1 2 3 4 5 6 7 8 9 (9.0, 0.2, A)	2 6 2 1 1 2 1 1 2 3 4 5 6 7 8 9 (4.5, 2.0, I)	3 5 1 2 3 4 5 6 7 8 9 (9.0, 0.4, A)	3 5 1 2 3 4 5 6 7 8 9 (9.0, 0.4, A)	3 5 3 2 1 2 1 2 3 4 5 6 7 8 9 (4.0, 1.8, I)	2 2 1 3 1 2 3 4 5 6 7 8 9 (7.5, 1.1, 1)	3 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.2, I)	2 1 4 1 1 2 3 4 5 6 7 8 9 (5.0, 1.2, I)	(19- 27)
2. Three vesse) disease										
a. Ejection fraction >50%	2 6 1 2 3 4 5 6 7 8 9 (9.0, 0.2, A)	1 1 3 3 1 2 3 4 5 6 7 8 9 (8.0, 0.9, A)	3 2 3 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	2 6 1 2 3 4 5 6 7 8 9 (9.0, 0.2, A)	2 2 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.2, I)	1 3 4 1 2 3 4 5 6 7 8 9 (8.5, 0.6, A)	4 4 1 2 3 4 5 6 7 8 9 (7.5, 0.5, A)	1 2 4 1 1 2 3 4 5 6 7 8 9 (5.0, 0.8, A)	1 4 3 1 2 3 4 5 6 7 8 9 (7.0, 0.9, A)	(28- 36)
b. Ejection fraction 25-49%	1 7 1 2 3 4 5 6 7 8 9 (9.0, 0.1, A)	1 4 3 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	4 1 3 1 2 3 4 5 6 7 8 9 (7.5, 0.9, A)	2 6 1 2 3 4 5 6 7 8 9 (9.0, 0.2, A)	1 1 4 2 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	1 3 4 1 2 3 4 5 6 7 8 9 (8.5, 0.6, A)	4 3 1 1 2 3 4 5 6 7 8 9 (7.5, 0.6, A)	1 2 3 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.1, I)	1 4 3 1 2 3 4 5 6 7 8 9 (7.0, 0.9, A)	(37- 45)
c. Ejection fraction <25%	3 5 1 2 3 4 5 6 7 8 9 (9.0, 0.4, A)	1 1 6 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	4 4 1 2 3 4 5 6 7 8 9 (7.5, 0.5, A)	2 3 3 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	1 1 1 1 4 1 2 3 4 5 6 7 8 9 (7.5, 1.4, I)	3 5 1 2 3 4 5 6 7 8 9 (8.0, 0.4, A)	2 4 2 1 2 3 4 5 6 7 8 9 (7.0, 0.5, A)	2 1 4 1 1 2 3 4 5 6 7 8 9 (5.0, 1.1, I)	1 2 3 2 1 2 3 4 5 6 7 8 9 (7.0, 1.0, A)	(46- 54)
3. Two vessel disease with proximal left anterior descending involvement										
a. With a very positive exercise ECG										
a1. Ejection fraction >50%	2 6 1 2 3 4 5 6 7 8 9 (9.0, 0.2, A)	1 1 2 1 2 1 2 3 4 5 6 7 8 9 (7.0, 1.6, I)	2 1 5 1 2 3 4 5 6 7 8 9 (9.0, 0.6, A)	4 4 1 2 3 4 5 6 7 8 9 (8.5, 0.5, A)	1 3 1 2 1 2 3 4 5 6 7 8 9 (5.5, 1.5, I)	1 3 4 1 2 3 4 5 6 7 8 9 (8.5, 0.6, A)	5 2 1 1 2 3 4 5 6 7 8 9 (7.0, 0.5, A)	1 2 2 2 1 1 2 3 4 5 6 7 8 9 (4.0, 1.4, I)	1 6 1 1 2 3 4 5 6 7 8 9 (8.0, 0.2, A)	(55- 63)
a2. Ejection fraction 25-49%	1 7 1 2 3 4 5 6 7 8 9 (9.0, 0.1, A)	1 1 3 2 1 2 3 4 5 6 7 8 9 (8.0, 1.4, I)	2 2 4 1 2 3 4 5 6 7 8 9 (8.5, 0.8, A)	3 5 1 2 3 4 5 6 7 8 9 (9.0, 0.4, A)	1 1 4 2 1 2 3 4 5 6 7 8 9 (7.0, 1.1, I)	1 4 3 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	4 3 1 1 2 3 4 5 6 7 8 9 (7.5, 0.6, A)	1 1 2 1 2 1 1 2 3 4 5 6 7 8 9 (4.5, 1.8, I)	1 7 1 2 3 4 5 6 7 8 9 (8.0, 0.1, A)	(64- 72)
a3. Ejection fraction <25%	2 2 4 1 2 3 4 5 6 7 8 9 (8.5, 0.8, A)	1 2 1 3 1 1 2 3 4 5 6 7 8 9 (7.0, 1.9, I)	3 2 3 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	1 1 4 2 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	2 2 1 3 1 2 3 4 5 6 7 8 9 (5.5, 2.0, D)	3 2 3 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	2 1 4 1 1 2 3 4 5 6 7 8 9 (7.0, 0.9, A)	2 2 1 1 2 1 2 3 4 5 6 7 8 9 (3.0, 1.9, I)	4 4 1 2 3 4 5 6 7 8 9 (7.5, 0.5, A)	(73- 81)
b. With a negative to minimally positive exercise ECG										
b1. Ejection fraction >50%	1 3 4 1 2 3 4 5 6 7 8 9 (8.5, 0.6, A)	1 1 1 2 2 1 2 3 4 5 6 7 8 9 (6.5, 1.6, I)	3 2 3 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	1 5 2 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	1 1 1 1 3 1 1 2 3 4 5 6 7 8 9 (5.5, 1.4, I)	2 4 2 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	1 1 1 3 1 1 1 2 3 4 5 6 7 8 9 (7.0, 1.1, I)	2 1 1 3 1 1 2 3 4 5 6 7 8 9 (3.5, 1.2, I)	1 2 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.9, A)	(82- 90)
b2. Ejection fraction 25-49%	1 2 5 1 2 3 4 5 6 7 8 9 (9.0, 0.5, A)	1 1 1 2 3 1 2 3 4 5 6 7 8 9 (7.0, 1.5, I)	3 3 2 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	1 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	1 1 1 2 3 1 2 3 4 5 6 7 8 9 (6.0, 1.2, I)	2 5 1 1 2 3 4 5 6 7 8 9 (8.0, 0.4, A)	1 1 1 3 2 1 2 3 4 5 6 7 8 9 (7.0, 1.0, I)	1 1 1 3 1 1 1 2 3 4 5 6 7 8 9 (4.0, 1.1, I)	1 2 5 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	(91- 99)
b3. Ejection fraction <25%	1 2 3 2 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	1 4 1 2 1 2 3 4 5 6 7 8 9 (5.0, 1.2, I)	3 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	1 3 3 1 1 2 3 4 5 6 7 8 9 (7.5, 0.8, A)	1 1 4 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.2, D)	1 2 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	1 2 1 3 1 1 2 3 4 5 6 7 8 9 (6.5, 1.6, I)	3 1 2 1 1 1 2 3 4 5 6 7 8 9 (2.5, 1.4, I)	1 2 2 3 1 2 3 4 5 6 7 8 9 (7.0, 1.0, A)	(100-108)

hapter 1

HRONIC STABLE ANGINA

	NORMAL OR LOW RISK			MODERATELY HIGH RISK			VERY HIGH RISK			
	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	
4. Two vessel disease without proximal left anterior descending involvement										
a. With a very positive exercise ECG										
a1. Ejection fraction >50%	3 5 1 2 3 4 5 6 7 8 9 (9.0, 0.4, A)	1 2 1 2 1 1 1 2 3 4 5 6 7 8 9 (5.5, 1.5, I)	5 3 1 2 3 4 5 6 7 8 9 (8.0, 0.4, A)	7 1 2 1 1 3 1 1 2 3 4 5 6 7 8 9 (8.0, 0.1, A)	1 2 3 4 5 6 7 8 9 (4.5, 1.2, I)	6 2 1 2 3 4 5 6 7 8 9 (8.0, 0.2, A)	7 1 2 1 4 1 1 2 3 4 5 6 7 8 9 (7.0, 0.2, A)	1 2 3 4 5 6 7 8 9 (3.0, 0.9, A)	3 5 1 2 3 4 5 6 7 8 9 (8.0, 0.4, A)	(109-117)
a2. Ejection fraction 25-49%	2 6 1 2 3 4 5 6 7 8 9 (9.0, 0.2, A)	1 1 1 2 2 1 1 2 3 4 5 6 7 8 9 (6.0, 1.4, I)	1 4 3 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	6 2 1 2 3 4 5 6 7 8 9 (8.0, 0.2, A)	1 1 1 2 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.2, I)	1 5 2 1 2 3 4 5 6 7 8 9 (8.0, 0.4, A)	7 1 1 1 4 1 1 1 2 3 4 5 6 7 8 9 (7.0, 0.2, A)	1 2 3 4 5 6 7 8 9 (3.0, 0.8, A)	4 4 1 2 3 4 5 6 7 8 9 (7.5, 0.5, A)	(118-126)
a3. Ejection fraction <25%	1 1 2 4 1 2 3 4 5 6 7 8 9 (8.5, 1.1, A)	2 1 2 1 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.8, D)	1 4 3 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	1 1 5 1 3 1 1 2 1 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	1 2 3 4 5 6 7 8 9 (3.5, 1.4, I)	2 4 2 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	1 1 1 4 1 3 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.0, A)	1 2 3 4 5 6 7 8 9 (2.0, 1.0, A)	1 3 4 1 2 3 4 5 6 7 8 9 (7.5, 0.6, A)	(127-135)
b. [illegible] negative to minimally positive exercise ECG										
b1. Ejection fraction >50%	1 1 4 2 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	2 1 3 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.2, I)	1 1 5 1 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	1 2 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.9, A)	2 3 1 2 1 2 3 4 5 6 7 8 9 (3.0, 0.9, I)	1 1 5 1 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	1 3 3 1 2 1 4 1 1 2 3 4 5 6 7 8 9 (6.5, 1.1, A)	1 2 3 4 5 6 7 8 9 (3.0, 0.9, A)	1 3 4 1 2 3 4 5 6 7 8 9 (7.5, 0.8, A)	(136-144)
b2. Ejection fraction 25-49%	1 1 3 3 1 2 3 4 5 6 7 8 9 (8.0, 0.9, A)	1 1 4 1 1 1 2 3 4 5 6 7 8 9 (5.0, 0.9, A)	1 2 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	1 2 3 2 1 4 1 1 1 1 2 3 4 5 6 7 8 9 (8.0, 1.0, A)	1 2 3 4 5 6 7 8 9 (3.0, 0.9, A)	1 2 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	1 3 3 1 2 1 4 1 1 2 3 4 5 6 7 8 9 (6.5, 1.0, A)	1 2 3 4 5 6 7 8 9 (3.0, 0.9, A)	1 4 3 1 2 3 4 5 6 7 8 9 (7.0, 0.6, A)	(145-153)
b3. Ejection fraction <25%	1 1 1 4 1 1 2 1 2 1 1 1 2 3 4 5 6 7 8 9 (8.0, 1.1, I)	1 2 1 2 1 1 2 3 4 5 6 7 8 9 (4.5, 1.8, I)	2 1 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	2 2 3 1 1 4 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.4, I)	1 2 3 4 5 6 7 8 9 (2.5, 1.1, I)	1 2 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	2 2 1 2 1 3 2 2 1 1 2 3 4 5 6 7 8 9 (5.5, 1.5, D)	1 2 3 4 5 6 7 8 9 (2.0, 1.0, A)	1 1 3 3 1 2 3 4 5 6 7 8 9 (7.0, 0.8, A)	(154-162)
5. Single vessel disease - proximal left anterior descending										
a. Ejection fraction >50%	2 4 1 1 1 1 1 3 1 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	1 2 3 4 5 6 7 8 9 (6.5, 1.9, D)	4 4 1 2 3 4 5 6 7 8 9 (8.5, 0.5, A)	4 2 2 1 1 1 1 1 1 2 1 2 3 4 5 6 7 8 9 (7.5, 0.8, A)	1 2 3 4 5 6 7 8 9 (4.5, 1.9, D)	1 2 5 1 2 3 4 5 6 7 8 9 (9.0, 0.5, A)	4 3 1 3 2 1 1 1 1 2 3 4 5 6 7 8 9 (6.5, 0.6, A)	1 2 3 4 5 6 7 8 9 (2.0, 1.1, I)	1 1 3 3 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	(163-171)
b. Ejection fraction 25-49%	1 4 3 1 1 1 1 3 1 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	1 2 3 4 5 6 7 8 9 (6.5, 1.9, D)	5 3 1 2 3 4 5 6 7 8 9 (8.0, 0.4, A)	3 3 2 1 1 1 1 1 1 2 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	1 2 3 4 5 6 7 8 9 (4.5, 1.9, D)	1 3 4 1 2 3 4 5 6 7 8 9 (8.5, 0.6, A)	3 4 1 1 2 3 4 5 6 7 8 9 (7.0, 0.5, A)	3 2 1 2 1 2 3 4 5 6 7 8 9 (2.0, 1.2, I)	1 1 4 2 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	(172-180)
c. Ejection fraction <25%	1 1 4 2 1 2 2 1 2 1 2 3 4 5 6 7 8 9 (8.0, 1.1, A)	1 2 3 4 5 6 7 8 9 (5.0, 1.9, D)	6 2 1 2 3 4 5 6 7 8 9 (8.0, 0.2, A)	1 4 1 2 1 2 1 2 1 1 1 2 3 4 5 6 7 8 9 (7.0, 1.2, A)	1 2 3 4 5 6 7 8 9 (3.5, 1.4, I)	1 4 3 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	1 1 4 1 1 1 2 3 4 5 6 7 8 9 (6.0, 1.1, I)	4 2 1 1 2 3 4 5 6 7 8 9 (1.5, 0.9, A)	1 1 5 1 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	(181-189)
6. Single vessel disease - any vessel other than PLAD										
a. Ejection fraction >50%	1 2 4 1 2 1 1 1 1 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	1 2 3 4 5 6 7 8 9 (3.0, 1.2, I)	5 3 1 2 3 4 5 6 7 8 9 (8.0, 0.4, A)	1 1 3 2 1 3 1 3 1 1 2 3 4 5 6 7 8 9 (7.0, 0.9, A)	1 2 3 4 5 6 7 8 9 (2.5, 1.0, A)	1 3 4 1 2 3 4 5 6 7 8 9 (8.5, 0.6, A)	2 1 3 1 1 1 2 3 4 5 6 7 8 9 (6.0, 1.0, I)	4 2 2 1 2 3 4 5 6 7 8 9 (1.5, 0.8, A)	1 2 3 2 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	(190-198)
b. Ejection fraction 25-49%	1 2 4 1 2 1 1 1 1 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	1 2 3 4 5 6 7 8 9 (3.0, 1.2, I)	5 3 1 2 3 4 5 6 7 8 9 (8.0, 0.4, A)	2 3 2 1 3 1 3 1 1 2 3 4 5 6 7 8 9 (7.0, 0.8, A)	1 2 3 4 5 6 7 8 9 (2.5, 1.0, A)	1 3 4 1 2 3 4 5 6 7 8 9 (8.5, 0.6, A)	2 1 3 1 1 1 2 3 4 5 6 7 8 9 (6.0, 1.0, I)	4 2 2 1 2 3 4 5 6 7 8 9 (1.5, 0.8, A)	1 2 3 2 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	(199-207)
c. Ejection fraction <25%	1 1 1 4 1 4 1 2 1 1 2 3 4 5 6 7 8 9 (8.0, 1.2, A)	1 2 3 4 5 6 7 8 9 (1.5, 1.4, A)	6 2 1 2 3 4 5 6 7 8 9 (8.0, 0.2, A)	1 3 1 2 1 4 2 2 1 2 3 4 5 6 7 8 9 (6.5, 1.5, A)	1 2 3 4 5 6 7 8 9 (1.5, 0.8, A)	1 4 3 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	1 2 3 1 1 1 2 3 4 5 6 7 8 9 (4.0, 1.4, I)	6 2 1 2 3 4 5 6 7 8 9 (1.0, 0.5, A)	1 2 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	(208-216)

Chapter 1

CHRONIC STABLE ANGINA

	NORMAL OR LOW RISK			MODERATELY HIGH RISK			VERY HIGH RISK			
	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	
ON LESS THAN MAXIMAL MEDICAL THERAPY										
1. Left main disease										
a. Ejection fraction >50%	2 6 1 2 3 4 5 6 7 8 9 (9.0, 0.2, A)	2 6 1 2 3 4 5 6 7 8 9 (9.0, 0.2, A)	2 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (3.5, 2.2, D)	2 6 1 2 3 4 5 6 7 8 9 (9.0, 0.2, A)	1 1 1 5 1 2 3 4 5 6 7 8 9 (9.0, 0.8, A)	1 2 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (3.5, 2.1, D)	1 2 2 2 1 2 3 4 5 6 7 8 9 (8.0, 0.9, I)	1 2 1 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.3, I)	2 1 2 1 2 1 2 3 4 5 6 7 8 9 (4.0, 1.5, D)	(217-225)
b. Ejection fraction 25-49%	2 6 1 2 3 4 5 6 7 8 9 (9.0, 0.2, A)	2 6 1 2 3 4 5 6 7 8 9 (9.0, 0.2, A)	2 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (3.5, 2.2, D)	2 6 1 2 3 4 5 6 7 8 9 (9.0, 0.2, A)	1 1 1 5 1 2 3 4 5 6 7 8 9 (9.0, 0.8, A)	1 2 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (3.5, 2.1, D)	1 2 2 2 1 2 3 4 5 6 7 8 9 (8.0, 0.9, I)	1 1 1 1 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.4, I)	2 2 2 2 1 2 3 4 5 6 7 8 9 (4.0, 1.8, D)	(226-234)
c. Ejection fraction <25%	1 2 5 1 2 3 4 5 6 7 8 9 (9.0, 0.6, A)	1 2 5 1 2 3 4 5 6 7 8 9 (9.0, 0.6, A)	2 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (3.5, 2.2, D)	1 1 1 5 1 2 3 4 5 6 7 8 9 (9.0, 0.8, A)	2 1 1 4 1 2 3 4 5 6 7 8 9 (8.5, 1.1, I)	1 2 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (3.5, 2.1, D)	1 2 1 1 2 1 2 3 4 5 6 7 8 9 (7.0, 1.9, I)	1 2 1 1 1 1 1 2 3 4 5 6 7 8 9 (6.0, 2.1, I)	3 1 2 2 1 2 3 4 5 6 7 8 9 (4.0, 1.9, D)	(235-243)
2. Three vessel disease										
a. Ejection fraction >50%	2 3 3 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	1 4 3 1 2 3 4 5 6 7 8 9 (7.0, 0.6, A)	1 1 1 5 1 2 3 4 5 6 7 8 9 (8.0, 0.9, A)	1 3 3 1 1 2 3 4 5 6 7 8 9 (7.5, 0.8, A)	1 3 4 1 2 3 4 5 6 7 8 9 (6.5, 0.6, A)	1 1 1 3 2 1 2 3 4 5 6 7 8 9 (7.0, 1.2, I)	1 1 4 1 1 1 2 3 4 5 6 7 8 9 (6.0, 0.8, A)	1 2 1 3 1 1 2 3 4 5 6 7 8 9 (4.5, 1.2, A)	2 5 1 1 2 3 4 5 6 7 8 9 (7.0, 0.6, A)	(244-252)
b. Ejection fraction 25-49%	1 4 3 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	1 3 3 1 1 2 3 4 5 6 7 8 9 (7.5, 0.9, A)	1 2 5 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	1 2 2 3 1 2 3 4 5 6 7 8 9 (8.0, 0.9, A)	1 3 2 2 1 2 3 4 5 6 7 8 9 (6.5, 0.9, A)	1 1 1 2 3 1 2 3 4 5 6 7 8 9 (7.0, 1.4, I)	1 3 2 2 1 2 3 4 5 6 7 8 9 (6.5, 1.0, A)	2 3 2 1 1 2 3 4 5 6 7 8 9 (4.0, 0.9, A)	2 5 1 1 2 3 4 5 6 7 8 9 (7.0, 0.6, A)	(253-261)
c. Ejection fraction <25%	1 2 3 2 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	2 1 5 1 2 3 4 5 6 7 8 9 (8.0, 1.0, I)	1 1 1 5 1 2 3 4 5 6 7 8 9 (8.0, 1.0, I)	1 5 2 1 2 3 4 5 6 7 8 9 (7.0, 0.6, A)	2 2 3 1 1 2 3 4 5 6 7 8 9 (6.5, 0.9, A)	1 1 1 3 2 1 2 3 4 5 6 7 8 9 (7.0, 1.2, I)	1 1 2 2 2 1 2 3 4 5 6 7 8 9 (5.5, 1.6, D)	1 1 2 2 1 1 1 2 3 4 5 6 7 8 9 (3.5, 1.5, I)	2 3 2 1 1 2 3 4 5 6 7 8 9 (6.0, 0.8, A)	(262-270)
3. Two vessel disease with proximal left anterior descending involvement										
a. With a very positive exercise ECG										
a1. Ejection fraction >50%	1 4 3 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	1 3 1 3 1 2 3 4 5 6 7 8 9 (6.5, 1.4, A)	1 5 2 1 2 3 4 5 6 7 8 9 (8.0, 0.4, A)	1 2 3 2 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	1 3 2 1 1 1 2 3 4 5 6 7 8 9 (5.5, 1.2, A)	4 3 1 1 2 3 4 5 6 7 8 9 (7.5, 0.6, A)	1 2 4 1 1 1 2 3 4 5 6 7 8 9 (6.0, 0.9, A)	1 2 3 4 5 1 2 3 4 5 6 7 8 9 (4.0, 1.0, A)	1 4 3 1 1 2 3 4 5 6 7 8 9 (5.5, 0.9, A)	(271-279)
a2. Ejection fraction 25-49%	1 4 3 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	1 1 1 4 1 1 2 3 4 5 6 7 8 9 (8.0, 1.2, A)	7 1 1 2 3 4 5 6 7 8 9 (8.0, 0.1, A)	3 2 3 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	1 1 2 2 2 1 2 3 4 5 6 7 8 9 (6.5, 1.4, I)	5 2 1 1 2 3 4 5 6 7 8 9 (7.0, 0.5, A)	1 4 2 1 1 2 3 4 5 6 7 8 9 (6.0, 0.6, A)	1 1 3 2 1 1 2 3 4 5 6 7 8 9 (4.0, 1.1, I)	1 4 2 1 1 2 3 4 5 6 7 8 9 (7.0, 0.6, A)	(280-288)
a3. Ejection fraction <25%	1 1 1 4 1 1 2 3 4 5 6 7 8 9 (8.0, 1.1, A)	1 1 1 1 4 1 2 3 4 5 6 7 8 9 (7.5, 1.9, D)	1 6 1 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	1 1 3 2 1 2 3 4 5 6 7 8 9 (7.0, 1.1, A)	2 1 1 2 2 1 2 3 4 5 6 7 8 9 (6.5, 1.9, D)	1 4 2 1 1 2 3 4 5 6 7 8 9 (7.0, 0.6, A)	1 1 2 3 1 1 2 3 4 5 6 7 8 9 (5.5, 1.2, A)	2 2 2 1 1 1 2 3 4 5 6 7 8 9 (3.0, 1.6, I)	2 3 2 1 1 2 3 4 5 6 7 8 9 (7.0, 0.8, A)	(289-297)
b. With a negative to minimally positive exercise ECG										
b1. Ejection fraction >50%	2 1 1 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.4, I)	2 1 1 2 1 1 1 2 3 4 5 6 7 8 9 (5.5, 1.8, D)	1 1 3 1 2 1 2 3 4 5 6 7 8 9 (7.0, 1.2, I)	1 1 2 2 2 1 2 3 4 5 6 7 8 9 (7.0, 1.9, I)	1 1 1 1 1 3 1 2 3 4 5 6 7 8 9 (4.5, 1.6, D)	1 2 1 3 1 1 2 3 4 5 6 7 8 9 (7.5, 1.4, A)	1 1 2 1 1 1 1 1 2 3 4 5 6 7 8 9 (4.0, 2.1, D)	3 1 2 1 1 1 2 3 4 5 6 7 8 9 (2.5, 1.2, I)	2 2 1 2 1 1 2 3 4 5 6 7 8 9 (6.5, 1.8, D)	(298-306)
b2. Ejection fraction 25-49%	2 3 1 2 1 2 3 4 5 6 7 8 9 (7.0, 0.9, I)	1 1 2 2 1 2 3 4 5 6 7 8 9 (5.5, 1.4, I)	1 2 3 3 1 1 2 3 4 5 6 7 8 9 (7.5, 1.2, A)	1 2 2 1 2 1 2 3 4 5 6 7 8 9 (7.0, 1.1, I)	1 1 2 1 2 1 1 2 3 4 5 6 7 8 9 (4.5, 1.4, I)	1 2 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.2, A)	1 2 2 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.6, D)	3 1 2 1 1 1 2 3 4 5 6 7 8 9 (2.5, 1.4, I)	2 2 3 1 1 2 3 4 5 6 7 8 9 (6.5, 1.5, D)	(307-315)
b3. Ejection fraction <25%	1 1 1 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.5, I)	1 2 2 1 2 1 2 3 4 5 6 7 8 9 (5.0, 2.2, D)	1 1 2 3 1 1 2 3 4 5 6 7 8 9 (7.5, 1.2, I)	1 2 2 1 1 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.6, I)	1 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (4.5, 2.2, D)	1 1 1 3 1 1 1 2 3 4 5 6 7 8 9 (7.0, 1.5, I)	1 1 2 1 2 1 1 1 2 3 4 5 6 7 8 9 (3.5, 1.9, I)	3 2 2 1 1 2 3 4 5 6 7 8 9 (2.0, 1.4, I)	1 1 1 2 2 1 1 2 3 4 5 6 7 8 9 (6.0, 1.4, I)	(316-324)

hapter 1

IRONIC STABLE ANGINA

	NORMAL OR LOW RISK			MODERATELY HIGH RISK			VERY HIGH RISK			
	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	
4. Two vessel disease without proximal left anterior descending involvement										
a. With a very positive exercise ECG										
a1. Ejection fraction >50%	3 1 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.1, I)	1 1 4 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.1, I)	2 2 3 1 1 2 3 4 5 6 7 8 9 (7.5, 0.9, A)	1 2 1 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.1, I)	1 3 1 2 1 2 3 4 5 6 7 8 9 (4.0, 1.0, I)	1 1 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.0, I)	1 2 1 1 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.9, D)	2 2 1 1 1 1 2 3 4 5 6 7 8 9 (2.0, 1.1, I)	1 1 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.3, I)	(325-333)
a2. Ejection fraction 25-49%	2 2 1 3 1 2 3 4 5 6 7 8 9 (7.5, 1.1, I)	1 4 3 1 2 3 4 5 6 7 8 9 (5.0, 1.5, I)	2 1 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	1 1 1 3 1 1 2 3 4 5 6 7 8 9 (8.0, 1.0, I)	1 2 1 1 2 1 2 3 4 5 6 7 8 9 (5.0, 1.4, I)	1 1 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.0, I)	2 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.6, D)	2 2 1 1 1 1 2 3 4 5 6 7 8 9 (2.0, 1.3, I)	1 1 4 1 1 2 3 4 5 6 7 8 9 (7.0, 1.0, I)	(334-342)
a3. Ejection fraction <25%	1 1 1 2 2 1 1 1 2 , 1 2 1 2 3 4 5 6 7 8 9 (7.0, 1.5, I)	1 2 3 4 5 6 7 8 9 (5.5, 2.0, D)	1 1 2 3 1 1 2 3 4 5 6 7 8 9 (7.5, 1.0, A)	2 1 3 1 1 3 4 5 6 7 8 9 (7.0, 1.0, I)	1 2 1 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.4, I)	2 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.1, I)	2 2 2 1 1 2 3 4 5 6 7 8 9 (4.0, 1.4, I)	2 2 2 1 1 2 3 4 5 6 7 8 9 (2.0, 1.4, I)	3 1 2 1 1 2 3 4 5 6 7 8 9 (6.0, 1.1, I)	(343-351)
b. With a negative to minimally positive exercise ECG										
b1. Ejection fraction >50%	1 1 2 1 1 2 1 2 3 4 5 6 7 8 9 (5.5, 1.9, I)	2 1 1 2 1 1 1 2 3 4 5 6 7 8 9 (4.5, 1.8, D)	1 1 2 1 2 1 1 2 3 4 5 6 7 8 9 (5.5, 1.9, I)	2 2 1 2 1 1 2 3 4 5 6 7 8 9 (5.5, 1.9, D)	2 2 1 1 2 1 2 3 4 5 6 7 8 9 (3.5, 1.4, I)	1 1 3 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.9, D)	2 1 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (3.5, 2.2, D)	3 3 1 1 1 2 3 4 5 6 7 8 9 (2.0, 1.0, I)	2 2 1 2 1 1 2 3 4 5 6 7 8 9 (6.0, 2.2, D)	(352-360)
b2. Ejection fraction 25-49%	1 1 1 1 1 1 2 1 2 3 4 5 6 7 8 9 (6.5, 1.9, I)	2 1 1 1 1 2 1 2 3 4 5 6 7 8 9 (4.5, 2.1, D)	1 2 1 2 1 1 2 3 4 5 6 7 8 9 (5.5, 1.9, I)	2 1 1 1 2 1 1 2 3 4 5 6 7 8 9 16.5, 1.9, D)	2 2 1 1 1 1 1 2 3 4 5 6 7 8 9 (3.5, 1.5, I)	1 1 2 2 1 1 1 2 3 4 5 6 7 8 9 (6.0, 2.0, D)	1 1 2 1 1 1 1 1 2 3 4 5 6 7 8 9 (3.5, 2.0, D)	3 3 1 1 1 2 3 4 5 6 7 8 9 (2.0, 1.0, I)	2 2 3 1 1 2 3 4 5 6 7 8 9 (6.0, 2.0, D)	(361-369)
b3. Ejection fraction <25%	1 2 1 1 2 1 1 1 1 1 2 2 1 2 3 4 5 6 7 8 9 (6.0, 2.2, I)	1 1 1 1 1 2 1 1 2 3 4 5 6 7 8 9 (4.5, 2.0, D)	1 2 2 1 1 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.8, I)	1 1 1 1 1 2 1 1 2 3 4 5 6 7 8 9 (5.5, 2.0, D)	1 1 1 3 1 1 1 1 2 3 4 5 6 7 8 9 13.0, 1.4, I)	1 1 2 2 1 1 1 2 3 4 5 6 7 8 9 (6.0, 2.0, D)	2 2 1 2 1 1 1 2 3 4 5 6 7 8 9 (2.5, 2.1, I)	3 3 1 1 1 2 3 4 5 6 7 8 9 (2.0, 1.0, I)	2 2 1 2 1 1 2 3 4 5 6 7 8 9 (5.5, 1.9, D)	(370-378)
5. Single vessel disease - proximal left anterior descending										
a. Ejection fraction >50%	1 3 3 1 1 1 2 3 1 1 2 3 4 5 6 7 8 9 (7.5, 0.9, A)	1 2 3 4 5 6 7 8 9 (5.5, 1.5, I)	4 4 1 1 2 3 4 5 6 7 8 9 (7.5, 0.6, A)	1 4 2 1 2 1 1 2 2 1 2 3 4 5 6 7 8 9 (7.0, 0.9, A)	1 2 3 4 5 6 7 8 9 (4.5, 1.6, I)	5 2 1 1 2 3 4 5 6 7 8 9 (7.0, 0.5, A)	1 3 1 2 1 2 3 4 5 6 7 8 9 (4.5, 1.6, A)	1 3 1 2 1 1 2 3 4 5 6 7 8 9 (2.5, 1.1, I)	1 2 4 1 1 2 3 4 5 6 7 8 9 (8.0, 1.1, A)	(379-387)
b. Ejection fraction 25-49%	1 2 4 1 1 1 1 3 2 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	1 2 3 4 5 6 7 8 9 (6.0, 1.5, D)	4 3 1 1 2 3 4 5 6 7 8 9 (7.5, 0.6, A)	1 3 3 1 1 2 1 2 1 1 1 2 3 4 5 6 7 8 9 (7.5, 1.0, A)	1 2 3 4 5 6 7 8 9 (4.5, 1.5, I)	5 2 1 1 2 3 4 5 6 7 8 9 (7.0, 0.5, A)	1 3 1 1 1 1 1 2 3 4 5 6 7 8 9 (4.5, 1.8, I)	3 1 2 1 1 1 2 3 4 5 6 7 8 9 (2.5, 1.2, I)	1 1 1 4 1 1 2 3 4 5 6 7 8 9 (8.0, 1.2, I)	(388-396)
c. Ejection fraction <25%	2 1 2 2 1 3 1 1 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.9, D)	1 2 3 4 5 6 7 8 9 (4.0, 2.2, I)	1 5 1 1 1 2 3 4 5 6 7 8 9 17.0, 0.5, A)	2 1 2 2 1 3 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 2.0, D)	1 2 3 4 5 6 7 8 9 (3.0, 1.6, I)	1 6 1 1 2 3 4 5 6 7 8 9 (7.0, 0.4, A)	1 1 1 3 1 1 4 2 1 1 1 2 3 4 5 6 7 8 9 (4.0, 1.6, I)	1 2 3 4 5 6 7 8 9 (1.5, 0.9, A)	1 1 2 1 2 1 1 2 3 4 5 6 7 8 9 (6.5, 1.4, I)	(397-4051
6. Single vessel disease - any vessel other than PLAD										
a. Ejection fraction >50%	1 1 3 1 1 1 3 1 1 2 1 1 2 3 4 5 6 7 8 9 15.0, 1.8, I)	1 2 3 4 5 6 7 8 9 (2.5, 1.6, I)	1 1 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.5, I)	1 1 2 1 1 1 1 3 2 2 1 1 2 3 4 5 6 7 8 9 (4.5, 1.9, D)	1 2 3 4 5 6 7 8 9 (2.0, 0.9, A)	2 2 1 2 1 1 2 3 4 5 6 7 8 9 (6.0, 2.0, D)	2 2 1 1 1 1 5 2 1 1 2 3 4 5 6 7 8 9 12.5, 2.0, I)	1 2 3 4 5 6 7 8 9 (1.0, 0.5, A)	1 1 1 1 1 2 1 1 2 3 4 5 6 7 8 9 (6.0, 2.2, D)	(406-414)
b. Ejection fraction 25-49%	1 1 1 3 1 1 3 1 1 2 1 1 2 3 4 5 6 7 8 9 16.0, 1.6, I)	1 2 3 4 5 6 7 8 9 (2.5, 1.6, I)	1 1 4 1 1 1 2 3 4 5 6 7 8 9 (7.0, 1.2, I)	1 1 3 1 1 1 3 2 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.6, D)	1 2 3 4 5 6 7 8 9 (2.0, 0.9, A)	2 1 1 2 1 1 1 2 3 4 5 6 7 8 9 (6.5, 1.8, D)	2 2 1 1 1 1 5 2 1 1 2 3 4 5 6 7 8 9 12.5, 2.0, I)	1 2 3 4 5 6 7 8 9 (1.0, 0.5, A)	1 1 2 2 1 1 1 2 3 4 5 6 7 8 9 (6.0, 2.0, D)	(415-423)
c. Ejection fraction <25%	2 1 2 1 1 4 1 2 1 1 2 3 4 5 6 7 8 9 (5.0, 2.1, D)	1 1 1 3 1 1 1 2 3 4 5 6 7 8 9 11.5, 1.6, I)	1 1 3 1 1 1 1 2 3 4 5 6 7 8 9 (7.0, 1.4, I)	2 1 3 1 1 4 1 2 1 1 2 3 4 5 6 7 8 9 (5.0, 2.1, D)	1 2 3 4 5 6 7 8 9 (1.5, 1.0, A)	2 1 2 1 1 1 1 2 3 4 5 6 7 8 9 (6.0, 1.6, D)	3 2 1 1 1 5 2 1 1 2 3 4 5 6 7 8 9 (2.0, 1.9, I)	1 2 3 4 5 6 7 8 9 (1.0, 0.5, A)	1 1 2 1 1 1 1 1 2 3 4 5 6 7 8 9 (5.5, 1.9, D)	(424-432)

hapter 1

HRONIC STABLE ANGINA

	NORMAL OR LOW RISK			MODERATELY HIGH RISK			VERY HIGH RISK			
	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	
ATIENT HAS MILD OR MODERATE ANGINA CLASS I, II)										
ON MAXIMAL MEDICAL THERAPY										
1. Left main disease										
a. Ejection fraction >50%	2 6 1 2 3 4 5 6 7 8 9 (9.0, 0.2, A)	2 6 1 2 3 4 5 6 7 8 9 (9.0, 0.2, A)	2 1 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (3.5, 2.0, I)	3 5 1 2 3 4 5 6 7 8 9 (9.0, 0.4, A)	4 4 1 2 1 1 1 1 1 2 3 4 5 6 7 8 9 (8.5, 0.5, A)	1 1 2 3 4 5 6 7 8 9 (3.5, 1.9, I)	1 4 1 2 1 2 3 4 5 6 7 8 9 (7.0, 0.9, A)	1 1 1 4 1 1 3 1 1 1 1 1 2 3 4 5 6 7 8 9 (7.0, 1.2, I)	1 2 3 4 5 6 7 8 9 (3.0, 1.9, I)	(433-441)
b. Ejection fraction 25-49%	1 7 1 2 3 4 5 6 7 8 9 (9.0, 0.1, A)	1 7 1 2 3 4 5 6 7 8 9 (9.0, 0.1, A)	2 1 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (3.5, 2.0, I)	2 6 1 2 3 4 5 6 7 8 9 (9.0, 0.2, A)	3 5 1 2 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (9.0, 0.4, A)	1 1 2 3 4 5 6 7 8 9 (3.5, 1.9, I)	1 2 3 2 1 2 3 4 5 6 7 8 9 (8.0, 0.9, A)	1 1 1 2 2 1 1 3 1 1 1 1 1 2 3 4 5 6 7 8 9 (7.0, 1.5, I)	1 2 3 4 5 6 7 8 9 (3.0, 1.9, I)	(442-450)
c. Ejection fraction <25%	1 1 6 1 2 3 4 5 6 7 8 9 (9.0, 0.9, A)	1 1 6 1 2 3 4 5 6 7 8 9 (9.0, 0.9, A)	2 1 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (3.5, 2.0, I)	1 3 4 1 2 3 4 5 6 7 8 9 (8.5, 1.1, A)	1 4 3 2 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (8.0, 1.., A)	1 1 2 3 4 5 6 7 8 9 (3.5, 2.0, I)	1 1 1 2 1 2 1 2 3 4 5 6 7 8 9 (7.0, 1.6, I)	1 1 1 2 2 1 1 3 1 1 1 1 1 2 3 4 5 6 7 8 9 (6.0, 1.8, D)	1 2 3 4 5 6 7 8 9 (3.0, 1.9, I)	(451-459)
2. Three vessel disease										
a. Ejection fraction >50%	1 1 5 1 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	4 2 1 1 1 2 3 4 5 6 7 8 9 (6.0, 1.4, I)	1 2 3 2 1 2 3 4 5 6 7 8 9 (8.0, 0.9, A)	2 1 1 4 1 2 3 4 5 6 7 8 9 (7.5, 1.1, I)	4 1 1 2 1 2 3 4 5 6 7 8 9 (5.5, 1.1, I)	1 2 3 1 1 2 3 4 5 6 7 8 9 (7.5, 1.4, I)	1 2 3 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.1, I)	1 1 3 2 1 1 2 3 4 5 6 7 8 9 (3.0, 0.9, A)	1 2 1 2 1 1 1 2 3 4 5 6 7 8 9 (6.5, 1.6, I)	(460-468)
b. Ejection fraction 25-49%	4 4 1 2 3 4 5 6 7 8 9 (8.5, 0.5, A)	1 3 3 1 1 2 3 4 5 6 7 8 9 (7.5, 0.9, A)	1 2 3 2 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	2 5 1 1 2 3 4 5 6 7 8 9 (8.0, 0.4, A)	2 2 4 1 2 3 4 5 6 7 8 9 (7.5, 1.0, I)	1 1 2 3 1 1 2 3 4 5 6 7 8 9 (7.5, 1.2, A)	4 1 2 1 1 2 1 4 1 2 3 4 5 6 7 8 9 (5.5, 1.1, A)	1 1 2 2 1 1 1 2 3 4 5 6 7 8 9 (4.5, 1.1, A)	1 1 2 2 1 1 1 2 3 4 5 6 7 8 9 (6.5, 1.5, I)	(469-477)
c. Ejection fraction <25%	1 1 1 3 2 1 2 3 4 5 6 7 8 9 (8.0, 1.2, I)	1 2 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.5, I)	1 1 1 3 2 1 2 3 4 5 6 7 8 9 (8.0, 1.0, I)	1 1 1 1 3 1 1 2 3 4 5 6 7 8 9 (7.5, 1.5, I)	1 3 1 3 1 2 3 4 5 6 7 8 9 (6.0, 1.6, I)	1 1 1 3 1 1 2 3 4 5 6 7 8 9 (7.5, 1.5, I)	1 1 3 2 1 2 2 1 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.8, D)	2 2 1 2 1 1 2 3 4 5 6 7 8 9 (2.5, 1.6, I)	1 2 1 2 1 1 1 2 3 4 5 6 7 8 9 (6.5, 1.6, I)	(478-486)
3. Two vessel disease with proximal left anterior descending involvement										
a. With a very positive exercise ECG										
a1. Ejection fraction >50%	2 1 2 3 1 2 3 4 5 6 7 8 9 (8.0, 1.0, I)	1 1 3 1 2 1 2 3 4 5 6 7 8 9 (6.0, 1.2, I)	1 4 3 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	2 1 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	1 3 2 1 1 1 2 3 4 5 6 7 8 9 (5.5, 1.2, A)	1 6 1 1 2 3 4 5 6 7 8 9 (8.0, 0.2, A)	1 4 1 1 1 1 2 2 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.1, A)	1 2 3 4 5 6 7 8 9 (3.0, 1.0, I)	1 5 1 1 1 2 3 4 5 6 7 8 9 (7.0, 0.6, A)	(487-495)
a2. Ejection fraction 25-49%	4 4 1 2 3 4 5 6 7 8 9 (8.5, 0.5, A)	1 2 2 3 1 2 3 4 5 6 7 8 9 (7.0, 1.2, A)	2 3 3 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	1 1 1 2 3 4 5 6 7 8 9 (8.0, 0.1, A)	1 1 2 2 2 1 2 3 4 5 6 7 8 9 (6.5, 1.4, I)	2 5 1 1 2 3 4 5 6 7 8 9 (8.0, 0.4, A)	2 3 2 1 1 1 1 3 1 2 3 4 5 6 7 8 9 (6.0, 0.9, A)	1 2 3 4 5 6 7 8 9 (4.0, 1.3, I)	1 5 1 1 1 2 3 4 5 6 7 8 9 (7.0, 0.6, A)	(496-504)
a1. Ejection fraction <25%	1 1 1 2 3 1 2 3 4 5 6 7 8 9 (8.0, 1.6, I)	1 1 2 1 1 2 1 2 3 4 5 6 7 8 9 (5.5, 2.0, D)	2 1 2 3 1 2 3 4 5 6 7 8 9 (8.0, 1.0, I)	1 1 2 3 1 1 2 3 4 5 6 7 8 9 (7.5, 1.5, A)	1 1 1 2 1 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.8, D)	2 1 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	1 1 1 3 1 1 2 2 1 1 1 2 3 4 5 6 7 8 9 (6.0, 1.6, D)	1 2 3 4 5 6 7 8 9 (2.0, 1.4, I)	1 2 3 1 1 1 2 3 4 5 6 7 8 9 (7.0, 0.9, A)	(505-5131
b. With a negative to minimally positive exercise ECG										
b1. Ejection fraction >50%	1 2 1 4 1 2 3 4 5 6 7 8 9 (7.5, 1.4, I)	1 2 1 2 1 1 1 2 3 4 5 6 7 8 9 (5.5, 1.8, D)	1 1 1 3 1 1 2 3 4 5 6 7 8 9 (8.0, 1.6, I)	1 2 1 2 2 1 2 3 4 5 6 7 8 9 (6.5, 1.2, I)	3 1 2 1 1 1 2 3 4 5 6 7 8 9 (4.5, 1.8, I)	1 2 1 2 1 1 1 2 3 4 5 6 7 8 9 (6.5, 1.5, I)	1 1 3 1 1 3 2 2 1 1 2 3 4 5 6 7 8 9 (4.0, 1.4, I)	1 2 3 4 5 6 7 8 9 (2.0, 0.9, A)	1 2 1 1 2 1 1 2 3 4 5 6 7 8 9 (5.5, 1.5, I)	(514-5221
b2. Ejection fraction 25-49%	1 2 1 4 1 2 3 4 5 6 7 8 9 (7.5, 1.0, A)	1 1 1 3 1 1 1 2 3 4 5 6 7 8 9 (6.0, 1.2, I)	1 1 1 3 1 1 2 3 4 5 6 7 8 9 (7.5, 1.6, I)	2 2 2 2 1 2 3 4 5 6 7 8 9 (6.5, 1.0, I)	1 1 1 3 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.2, I)	1 2 3 1 1 1 2 3 4 5 6 7 8 9 (7.0, 1.1, A)	1 2 3 1 1 3 2 1 2 1 2 3 4 5 6 7 8 9 (5.0, 1.2, A)	1 2 3 4 5 6 7 8 9 (2.0, 1.0, I)	1 1 1 1 3 1 1 2 3 4 5 6 7 8 9 (6.5, 1.4, I)	(523-531)
b1. Ejection fraction <25%	1 1 2 1 3 1 2 3 4 5 6 7 8 9 (6.5, 1.6, I)	1 1 3 1 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.6, D)	1 2 1 1 2 1 1 2 3 4 5 6 7 8 9 (6.5, 1.8, I)	1 3 1 1 2 1 2 3 4 5 6 7 8 9 (5.5, 1.6, I)	1 1 3 1 1 1 1 2 3 4 5 6 7 8 9 (4.0, 1.5, I)	1 2 1 2 1 1 1 2 3 4 5 6 7 8 9 (6.5, 1.5, I)	1 2 2 1 1 1 1 2 3 4 5 6 7 8 9 (4.0, 1.4, I)	3 2 2 1 1 2 3 4 5 6 7 8 9 (2.0, 0.9, A)	1 1 2 1 2 1 1 2 3 4 5 6 7 8 9 (5.5, 1.4, I)	(532-5401

hapter 1

HRONIC STABLE ANGINA

	NORMAL OR LOW RISK			MODERATELY HIGH RISK			VERY HIGH RISK			
	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	
4. Two vessel disease without proximal left anterior descending involvement										
a. With a very positive exercise ECG										
a1. Ejection fraction >50%	3 2 1 2 1 2 3 4 5 6 7 8 9 (7.0, 1.0, I)	1 1 4 2 1 2 3 4 5 6 7 8 9 (5.0, 0.9, I)	2 3 1 2 1 2 3 4 5 6 7 8 9 (7.0, 1.1, I)	1 3 1 1 2 1 2 3 4 5 6 7 8 9 (6.5, 1.2, I)	1 1 1 2 2 1 2 3 4 5 6 7 8 9 (5.0, 1.1, I)	2 2 1 2 1 2 3 4 5 6 7 8 9 (7.0, 1.0, I)	1 1 2 1 2 1 1 2 3 4 5 6 7 8 9 (5.5, 1.5, I)	2 1 3 1 1 1 2 3 4 5 6 7 8 9 (3.0, 1.0, I)	3 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 0.9, A)	(541-549)
a2. Ejection fraction 25-49%	1 1 4 2 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	1 1 2 4 1 1 2 3 4 5 6 7 8 9 (5.5, 1.4, I)	1 1 3 1 2 1 2 3 4 5 6 7 8 9 (7.0, 1.0, I)	2 4 2 1 2 3 4 5 6 7 8 9 (8.0, 0.8, I)	1 1 1 2 1 2 1 2 3 4 5 6 7 8 9 (5.0, 1.4, D)	3 1 1 2 1 2 3 4 5 6 7 8 9 (7.0, 1.1, I)	1 4 2 1 1 2 3 4 5 6 7 8 9 (6.0, 0.9, A)	1 1 3 2 1 1 2 3 4 5 6 7 8 9 (3.0, 0.9, A)	4 1 2 1 1 2 3 4 5 6 7 8 9 (6.5, 1.0, A)	(550-558)
a3. Ejection fraction <25%	1 1 1 3 2 1 2 3 4 5 6 7 8 9 (8.0, 1.6, I)	1 1 1 1 3 1 1 2 3 4 5 6 7 8 9 (4.5, 1.5, I)	1 1 2 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.2, I)	1 1 3 1 2 1 2 3 4 5 6 7 8 9 (7.0, 1.6, I)	2 2 2 1 1 2 3 4 5 6 7 8 9 (3.0, 1.3, I)	1 1 2 1 2 1 2 3 4 5 6 7 8 9 (7.0, 1.1, I)	2 1 1 3 1 1 2 3 4 5 6 7 8 9 (6.5, 1.9, D)	3 2 1 1 1 1 2 3 4 5 6 7 8 9 (2.0, 1.4, I)	1 1 1 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.4, I)	(559-567)
b. With a negative to minimally positive exercise ECG										
b1. Ejection fraction >50%	1 1 1 1 1 1 2 1 2 3 4 5 6 7 8 9 (5.5, 2.0, D)	1 1 3 3 1 2 3 4 5 6 7 8 9 (3.0, 1.1, I)	1 2 2 1 1 1 1 2 3 4 5 6 7 8 9 (6.0, 1.4, I)	1 1 1 2 1 2 1 2 3 4 5 6 7 8 9 (5.0, 1.8, D)	1 1 3 2 1 1 2 3 4 5 6 7 8 9 (3.0, 0.9, A)	1 1 2 1 1 1 1 2 3 4 5 6 7 8 9 (6.0, 1.4, I)	1 2 1 2 1 1 1 2 3 4 5 6 7 8 9 (3.5, 1.8, I)	3 1 3 1 1 2 3 4 5 6 7 8 9 (2.5, 1.0, A)	1 2 1 2 1 1 1 2 3 4 5 6 7 8 9 (5.5, 1.6, I)	(568-576)
b2. Ejection fraction 25-49%	1 1 1 2 1 2 1 2 3 4 5 6 7 8 9 (6.0, 1.4, I)	1 4 4 1 2 3 4 5 6 7 8 9 (4.0, 1.1, A)	1 1 2 2 1 1 1 2 3 4 5 6 7 8 9 (6.5, 1.4, I)	1 1 3 1 2 1 2 3 4 5 6 7 8 9 (5.0, 1.4, I)	1 4 2 1 1 2 3 4 5 6 7 8 9 (3.0, 0.6, A)	1 2 1 1 1 1 1 2 3 4 5 6 7 8 9 (6.0, 1.6, I)	1 2 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (3.5, 1.9, I)	2 2 3 1 1 2 3 4 5 6 7 8 9 (2.5, 0.9, A)	1 2 1 2 1 1 1 2 3 4 5 6 7 8 9 (5.5, 1.6, I)	(577-585)
b3. Ejection fraction <25%	1 2 1 1 1 2 1 2 3 4 5 6 7 8 9 (5.5, 1.9, I)	1 1 2 1 3 1 2 3 4 5 6 7 8 9 (3.5, 1.2, I)	1 1 2 2 1 1 1 2 3 4 5 6 7 8 9 (6.0, 1.8, I)	1 1 2 1 1 2 2 1 3 1 1 1 2 3 4 5 6 7 8 9 (4.5, 2.1, D)	1 2 1 1 1 1 2 3 4 5 6 7 8 9 (3.0, 1.0, I)	1 2 1 1 1 1 1 2 3 4 5 6 7 8 9 (6.0, 1.6, I)	2 2 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (2.5, 1.8, I)	3 2 2 1 1 2 3 4 5 6 7 8 9 (2.0, 0.9, A)	1 1 3 1 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.6, D)	(586-594)
c. Single vessel disease - proximal left anterior descending										
a. With a very positive exercise ECG										
a1. Ejection fraction >50%	1 5 2 1 1 2 1 3 1 2 3 4 5 6 7 8 9 (8.0, 0.4, A)	2 3 3 1 2 3 4 5 6 7 8 9 (4.0, 2.1, D)	2 3 3 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	1 2 3 2 1 1 2 1 1 2 1 2 3 4 5 6 7 8 9 (8.0, 0.9, A)	4 1 3 1 2 3 4 5 6 7 8 9 (3.5, 1.8, D)	1 2 3 4 5 6 7 8 9 (7.5, 0.9, A)	1 1 1 2 2 1 1 2 3 4 5 6 7 8 9 (6.0, 1.6, I)	2 1 3 1 1 1 2 3 4 5 6 7 8 9 (3.0, 1.0, I)	2 2 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.0, I)	(595-603)
a2. Ejection fraction 25-49%	1 4 3 1 1 2 1 2 1 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	2 4 2 1 2 3 4 5 6 7 8 9 (4.0, 2.2, D)	2 4 2 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	3 2 3 1 1 2 1 1 1 1 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	4 2 2 1 2 3 4 5 6 7 8 9 (3.5, 1.9, D)	1 2 3 4 5 6 7 8 9 (7.5, 0.8, A)	1 2 3 1 1 1 2 3 4 5 6 7 8 9 (6.0, 1.2, I)	2 1 3 1 1 1 2 3 4 5 6 7 8 9 (3.0, 1.2, I)	2 2 3 1 1 2 3 4 5 6 7 8 9 (7.5, 0.9, A)	(604-612)
a3. Ejection fraction <25%	1 1 2 3 1 2 3 4 5 6 7 8 9 (8.0, 1.4, I)	1 2 2 1 1 1 1 2 3 4 5 6 7 8 9 (3.0, 1.8, D)	1 2 2 3 1 2 3 4 5 6 7 8 9 (8.0, 1.0, A)	1 2 3 1 2 2 1 1 1 1 2 3 4 5 6 7 8 9 (8.0, 1.6, I)	1 1 2 3 4 5 6 7 8 9 (3.0, 1.5, I)	1 3 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.0, A)	1 1 1 4 1 1 2 3 4 5 6 7 8 9 (6.0, 1.9, I)	3 2 2 1 1 2 3 4 5 6 7 8 9 (2.0, 1.1, A)	1 2 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.0, A)	(613-621)
b. With a negative to minimally positive exercise ECG										
b1. Ejection fraction >50%	1 1 1 1 1 3 2 1 2 1 1 1 1 2 3 4 5 6 7 8 9 (6.5, 2.0, D)	2 2 2 2 2 1 2 3 4 5 6 7 8 9 (1.0, 1.8, I)	2 2 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.4, A)	2 2 2 2 2 1 2 3 4 5 6 7 8 9 (5.5, 2.5, D)	2 1 1 2 2 1 2 3 4 5 6 7 8 9 (3.5, 1.4, I)	1 1 1 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.5, I)	2 1 3 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.9, I)	3 4 1 1 2 3 4 5 6 7 8 9 (2.0, 0.5, A)	2 1 4 1 1 2 3 4 5 6 7 8 9 (7.0, 1.4, D)	(622-630)
b2. Ejection fraction 25-49%	1 1 1 1 1 3 2 1 2 1 1 1 1 2 3 4 5 6 7 8 9 (6.5, 2.0, D)	2 2 2 1 2 3 4 5 6 7 8 9 (3.0, 1.8, I)	1 1 1 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.5, I)	2 2 2 1 2 3 4 5 6 7 8 9 (7.0, 2.4, D)	2 1 1 2 2 1 2 3 4 5 6 7 8 9 (3.5, 1.4, I)	1 2 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.6, I)	2 1 3 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.8, I)	3 4 1 1 2 3 4 5 6 7 8 9 (2.0, 0.5, A)	2 1 4 1 1 2 3 4 5 6 7 8 9 (7.0, 1.5, D)	(631-639)
b3. Ejection fraction <25%	2 1 1 1 3 2 1 2 1 1 1 1 2 3 4 5 6 7 8 9 (5.5, 2.4, D)	2 1 2 1 1 1 1 2 3 4 5 6 7 8 9 (3.0, 1.6, I)	1 2 1 1 2 1 1 2 3 4 5 6 7 8 9 (6.5, 1.8, I)	2 1 2 1 2 1 1 1 1 2 3 4 5 6 7 8 9 (5.0, 2.1, D)	2 1 1 3 1 1 2 3 4 5 6 7 8 9 (3.5, 1.2, I)	1 3 1 2 1 1 2 3 4 5 6 7 8 9 (6.0, 1.9, I)	2 1 1 1 1 2 1 2 3 4 5 6 7 8 9 (3.5, 1.8, I)	3 4 1 1 2 3 4 5 6 7 8 9 (2.0, 0.5, A)	2 2 3 1 1 2 3 4 5 6 7 8 9 (6.0, 1.8, D)	(640-648)

apter 1

RONIC STABLE ANGINA

	NORMAL OR LOW RISK			MODERATELY HIGH RISK			VERY HIGH RISK			
	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	
b. Single vessel disease - any vessel other than PIAD										
a. With a very positive exercise ECG										
a1. Ejection fraction >50%	1 1 1 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.5, I)	4 3 1 1 2 3 4 5 6 7 8 9 (2.5, 0.6, A)	3 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	1 1 1 3 1 1 1 6 1 1 2 3 4 5 6 7 8 9 (7.0, 1.4, I)	1 2 3 4 5 6 7 8 9 (2.0, 0.2, A)	3 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	2 1 2 2 1 3 5 1 2 3 4 5 6 7 8 9 (4.0, 2.0, I)	1 2 3 4 5 6 7 8 9 (2.0, 0.4, A)	1 4 2 1 1 2 3 4 5 6 7 8 9 (7.0, 0.6, A)	(649-657)
a2. Ejection fraction 25-49%	1 2 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.2, A)	4 3 1 1 2 3 4 5 6 7 8 9 (2.5, 0.6, A)	4 3 1 1 2 3 4 5 6 7 8 9 (7.5, 0.6, A)	1 2 3 1 1 1 6 1 1 2 3 4 5 6 7 8 9 (7.0, 1.1, A)	1 2 3 4 5 6 7 8 9 (2.0, 0.2, A)	1 3 3 1 1 2 3 4 5 6 7 8 9 (7.5, 0.8, A)	2 1 1 1 2 1 3 5 1 2 3 4 5 6 7 8 9 (4.5, 2.1, I)	1 2 3 4 5 6 7 8 9 (2.0, 0.4, A)	2 4 1 1 1 2 3 4 5 6 7 8 9 (7.0, 0.6, A)	(658-666)
a3. Ejection fraction <25%	2 1 1 3 1 1 2 3 4 5 6 7 8 9 (7.5, 2.4, D)	2 2 3 1 1 2 3 4 5 6 7 8 9 (2.5, 1.0, A)	1 1 1 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.9, A)	2 1 2 2 1 2 5 1 1 2 3 4 5 6 7 8 9 (7.0, 2.4, D)	1 2 3 4 5 6 7 8 9 (2.0, 0.5, A)	1 1 1 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.9, A)	2 1 1 3 1 4 3 1 1 2 3 4 5 6 7 8 9 (4.5, 2.5, I)	1 2 3 4 5 6 7 8 9 (1.5, 0.6, A)	1 1 4 1 1 1 2 3 4 5 6 7 8 9 (7.0, 0.8, A)	(667-675)
b. With a negative to minimally positive exercise ECG										
b1. Ejection fraction >50%	2 1 2 1 2 1 2 3 4 5 6 7 8 9 (4.0, 2.0, D)	3 3 2 1 2 3 4 5 6 7 8 9 (2.0, 0.6, A)	2 1 1 2 1 1 1 2 3 4 5 6 7 8 9 (6.5, 1.8, D)	2 1 2 1 1 1 3 5 1 2 3 4 5 6 7 8 9 (4.0, 2.0, D1	1 2 3 4 5 6 7 8 9 (2.0, 0.4, A1	1 1 1 3 1 1 1 2 3 4 5 6 7 8 9 (7.0, 1.5, 1)	3 2 1 1 1 4 4 1 2 3 4 5 6 7 8 9 (2.0, 1.9, 1)	1 2 3 4 5 6 7 8 9 (1.5, 0.5, A)	1 2 1 1 2 1 1 2 3 4 5 6 7 8 9 (5.5, 2.1, D)	(676-684)
b2. Ejection fraction 25-49%	2 1 2 1 2 1 2 3 4 5 6 7 8 9 (4.0, 2.0, D)	4 2 2 1 2 3 4 5 6 7 8 9 (1.5, 0.8, A)	2 1 1 2 1 1 1 2 3 4 5 6 7 8 9 (6.5, 1.9, D)	2 1 2 1 1 1 4 4 1 2 3 4 5 6 7 8 9 (4.0, 2.0, D1	1 2 3 4 5 6 7 8 9 (1.5, 0.5, A)	1 2 1 2 1 1 1 2 3 4 5 6 7 8 9 (6.0, 1.9, 1)	4 1 1 1 1 5 3 1 2 3 4 5 6 7 8 9 (1.5, 1.9, 1)	1 2 3 4 5 6 7 8 9 (1.0, 0.4, A)	1 2 1 2 1 1 1 2 3 4 5 6 7 8 9 (5.0, 2.1, D)	(685-693)
b3. Ejection fraction <25%	2 3 1 2 1 2 3 4 5 6 7 8 9 (1.0, 2.0, D)	4 2 2 1 2 3 4 5 6 7 8 9 (1.5, 0.8, A)	2 1 1 2 1 1 1 2 3 4 5 6 7 8 9 (6.0, 2.0, D)	2 1 2 1 1 1 4 4 1 2 3 4 5 6 7 8 9 (3.0, 2.0, D1	1 2 3 4 5 6 7 8 9 (1.5, 0.5, A)	1 2 1 2 1 1 1 2 3 4 5 6 7 8 9 (6.0, 1.9, 1)	5 1 2 6 2 1 2 3 4 5 6 7 8 9 (1.0, 1.6, I)	1 2 3 4 5 6 7 8 9 (1.0, 0.2, A)	1 2 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (4.5, 2.0, D)	(694-702)

Chapter 1

CHRONIC STABLE ANGINA

	NORMAL OR LOW RISK			MODERATELY HIGH RISK			VERY HIGH RISK			
	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	
PATIENT IS ON LESS THAN MAXIMAL MEDICAL THERAPY										
1. Left main disease										
a. Ejection fraction >50%	2 6 1 2 3 4 5 6 7 8 9 (9.0, 0.2, A)	1 1 6 1 2 3 4 5 6 7 8 9 (9.0, 0.4, A)	2 2 1 1 2 1 2 3 4 5 6 7 8 9 (2.5, 1.9, D)	4 4 1 2 3 4 5 6 7 8 9 (8.5, 0.5, A)	1 4 3 1 2 3 4 5 6 7 8 9 (8.0, 1.0, A)	2 2 1 1 1 1 2 3 4 5 6 7 8 9 (2.0, 1.4, I)	1 4 3 1 2 3 4 5 6 7 8 9 (7.0, 0.9, A)	1 1 2 2 2 1 2 3 4 5 6 7 8 9 (6.5, 1.5, I)	1 3 1 1 2 1 2 3 4 5 6 7 8 9 (2.5, 1.8, D)	(703-711)
b. Ejection fraction 25-49%	1 7 1 2 3 4 5 6 7 8 9 (9.0, 0.1, A)	1 7 1 2 3 4 5 6 7 8 9 (9.0, 0.2, A)	2 2 1 1 2 1 2 3 4 5 6 7 8 9 (2.5, 1.9, D)	3 5 1 2 3 4 5 6 7 8 9 (9.0, 0.4, A)	1 3 4 1 2 3 4 5 6 7 8 9 (8.5, 1.1, A)	2 2 1 1 1 1 2 3 4 5 6 7 8 9 (2.0, 1.4, I)	1 3 1 3 1 2 3 4 5 6 7 8 9 (7.5, 1.0, A)	1 1 2 1 1 2 1 2 3 4 5 6 7 8 9 (6.5, 1.6, I)	1 3 1 1 2 1 2 3 4 5 6 7 8 9 (2.5, 1.8, D)	(712-720)
c. Ejection fraction <25%	1 1 1 5 1 2 3 4 5 6 7 8 9 (9.0, 1.1, A)	1 2 5 1 2 3 4 5 6 7 8 9 (9.0, 1.2, A)	2 2 1 1 2 1 2 3 4 5 6 7 8 9 (2.5, 1.9, D)	1 1 2 4 1 2 3 4 5 6 7 8 9 (8.5, 1.4, I)	2 1 2 3 1 2 3 4 5 6 7 8 9 (8.0, 1.9, D)	2 3 1 1 1 2 3 4 5 6 7 8 9 (2.0, 1.3, I)	1 1 1 2 3 1 2 3 4 5 6 7 8 9 (7.0, 1.8, I)	1 1 2 2 2 1 2 3 4 5 6 7 8 9 (5.5, 1.9, D)	1 3 1 1 2 1 2 3 4 5 6 7 8 9 (2.5, 1.8, D)	(721-729)
2. Three vessel disease										
a. Ejection fraction >50%	2 1 2 3 1 2 3 4 5 6 7 8 9 (7.0, 1.0, I)	3 3 2 1 2 3 4 5 6 7 8 9 (6.0, 0.6, A)	1 2 1 3 1 1 2 3 4 5 6 7 8 9 (6.5, 1.2, A)	3 2 1 2 1 2 3 4 5 6 7 8 9 (6.0, 1.0, I)	1 6 1 1 2 3 4 5 6 7 8 9 (5.0, 0.4, A)	1 1 2 1 2 1 2 3 4 5 6 7 8 9 (6.0, 1.3, I)	2 1 1 3 1 1 2 3 4 5 6 7 8 9 (5.5, 1.4, I)	2 1 2 3 1 2 3 4 5 6 7 8 9 (4.0, 1.0, I)	1 2 2 2 1 1 2 3 4 5 6 7 8 9 (6.0, 1.1, A)	(730-738)
b. Ejection fraction 25-49%	1 1 6 1 2 3 4 5 6 7 8 9 (8.0, 0.4, A)	1 2 3 2 1 2 3 4 5 6 7 8 9 (7.0, 0.8, A)	1 2 3 2 1 2 3 4 5 6 7 8 9 (7.0, 1.0, A)	2 3 3 1 2 3 4 5 6 7 8 9 (7.0, 0.6, A)	1 3 2 1 1 1 2 3 4 5 6 7 8 9 (5.5, 1.1, A)	1 2 2 2 1 2 3 4 5 6 7 8 9 (7.0, 1.1, I)	2 1 1 2 1 1 1 2 3 4 5 6 7 8 9 (5.5, 1.5, D)	2 2 3 1 1 2 3 4 5 6 7 8 9 (4.0, 1.4, I)	1 5 1 1 1 2 3 4 5 6 7 8 9 (6.0, 0.8, A)	(739-747)
c. Ejection fraction <25%	1 1 5 1 1 2 3 4 5 6 7 8 9 (8.0, 1.2, I)	1 1 1 2 3 1 2 3 4 5 6 7 8 9 (7.0, 1.6, I)	1 1 1 3 1 1 1 2 3 4 5 6 7 8 9 (7.0, 1.4, I)	1 1 3 3 1 2 3 4 5 6 7 8 9 (7.0, 1.4, I)	1 1 1 1 3 1 1 2 3 4 5 6 7 8 9 (5.5, 1.5, I)	1 1 1 1 3 1 2 3 4 5 6 7 8 9 (7.0, 1.4, I)	1 1 1 1 1 2 1 1 2 3 4 5 6 7 8 9 (5.5, 2.1, D)	1 2 1 2 2 1 2 3 4 5 6 7 8 9 (4.0, 1.8, I)	1 1 3 2 1 1 2 3 4 5 6 7 8 9 (6.0, 1.0, A)	(748-756)
3. Two vessel disease with proximal left anterior descending involvement										
a. With a very positive exercise ECG										
a1. Ejection fraction >50%	2 2 3 1 1 2 3 4 5 6 7 8 9 (7.5, 0.9, A)	1 1 3 3 1 2 3 4 5 6 7 8 9 (6.0, 1.0, A)	4 3 1 1 2 3 4 5 6 7 8 9 (7.5, 0.6, A)	1 2 3 1 1 1 2 3 4 5 6 7 8 9 (7.0, 0.9, A)	1 1 3 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.1, I)	1 3 2 1 1 2 3 4 5 6 7 8 9 (7.0, 0.7, I)	2 2 3 1 1 2 3 4 5 6 7 8 9 (5.5, 1.1, A)	1 1 2 1 3 1 2 3 4 5 6 7 8 9 (3.5, 1.2, I)	2 1 3 1 1 1 2 3 4 5 6 7 8 9 (7.0, 1.0, I)	(757-765)
a2. Ejection fraction 25-49%	1 6 1 1 2 3 4 5 6 7 8 9 (8.0, 0.2, A)	1 1 1 3 2 1 2 3 4 5 6 7 8 9 (7.0, 1.2, I)	1 3 3 1 1 2 3 4 5 6 7 8 9 (7.5, 0.8, A)	1 3 3 1 1 2 3 4 5 6 7 8 9 (7.5, 0.8, A)	1 1 1 1 3 1 1 2 3 4 5 6 7 8 9 (6.5, 1.6, D)	1 4 1 1 1 2 3 4 5 6 7 8 9 (7.0, 0.6, I)	2 1 3 1 1 1 2 3 4 5 6 7 8 9 (6.0, 1.1, I)	1 2 1 1 3 1 2 3 4 5 6 7 8 9 (3.5, 1.4, I)	2 2 2 1 1 1 2 3 4 5 6 7 8 9 (6.5, 1.1, I)	(766-774)
a3. Ejection fraction <25%	1 1 1 3 2 1 2 3 4 5 6 7 8 9 (8.0, 1.5, I)	2 1 1 3 1 1 2 3 4 5 6 7 8 9 (6.0, 2.0, D)	1 1 2 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.2, I)	1 1 1 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.6, I)	2 1 1 3 1 1 2 3 4 5 6 7 8 9 (5.0, 1.9, I)	1 1 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.0, I)	1 1 1 4 1 1 2 3 4 5 6 7 8 9 (6.0, 1.8, I)	2 1 2 2 1 1 2 3 4 5 6 7 8 9 (3.0, 1.5, I)	2 3 1 1 1 1 2 3 4 5 6 7 8 9 (6.0, 1.0, I)	(775-783)
b. With a negative to minimally positive exercise ECG										
b1. Ejection fraction >50%	2 2 2 2 1 2 3 4 5 6 7 8 9 (6.0, 1.5, I)	1 1 1 2 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.2, I)	1 2 1 3 1 1 2 3 4 5 6 7 8 9 (6.5, 1.2, A)	3 1 2 2 1 2 3 4 5 6 7 8 9 (5.5, 1.4, I)	1 4 1 2 1 2 3 4 5 6 7 8 9 (3.0, 0.8, A)	1 1 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (6.0, 1.7, I)	1 2 2 1 1 1 1 2 3 4 5 6 7 8 9 (3.0, 1.8, I)	3 3 1 1 1 2 3 4 5 6 7 8 9 (2.0, 0.8, A)	1 2 1 2 1 1 1 2 3 4 5 6 7 8 9 (5.5, 2.0, D)	(784-792)
b2. Ejection fraction 25-49%	1 2 1 1 3 1 2 3 4 5 6 7 8 9 (6.5, 1.4, I)	1 1 1 2 3 1 2 3 4 5 6 7 8 9 (5.0, 1.5, D)	1 2 1 3 1 1 2 3 4 5 6 7 8 9 (6.5, 1.2, A)	2 2 2 2 1 2 3 4 5 6 7 8 9 (6.0, 1.5, I)	1 3 2 1 1 1 2 3 4 5 6 7 8 9 (3.5, 1.0, A)	2 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (6.0, 1.6, I)	1 1 2 2 1 1 1 2 3 4 5 6 7 8 9 (3.5, 1.6, I)	3 2 3 1 2 3 4 5 6 7 8 9 (2.0, 0.8, A)	1 1 1 1 2 1 1 1 2 3 4 5 6 7 8 9 (5.5, 1.9, D)	(793-801)
b3. Ejection fraction <25%	1 2 1 1 3 1 2 3 4 5 6 7 8 9 (5.5, 2.0, I)	1 1 2 1 3 1 2 3 4 5 6 7 8 9 (4.5, 1.6, D)	1 1 1 4 1 1 2 3 4 5 6 7 8 9 (7.0, 1.4, I)	1 1 2 1 1 2 1 2 3 4 5 6 7 8 9 (5.0, 2.1, D)	1 4 1 1 1 1 2 3 4 5 6 7 8 9 (3.0, 0.9, A)	2 1 2 1 1 1 2 3 4 5 6 7 8 9 (7.0, 1.6, I)	1 2 3 1 1 1 2 3 4 5 6 7 8 9 (3.0, 1.5, I)	3 4 1 1 2 3 4 5 6 7 8 9 (2.0, 0.5, A)	1 2 1 1 2 1 1 2 3 4 5 6 7 8 9 (5.0, 2.2, D)	(802-810)

apter 1

RONIC STABLE ANGINA

	NORMAL OR LOW RISK			MODERATELY HIGH RISK			VERY HIGH RISK			
	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	
4. Two vessel disease without proximal left anterior descending involvement										
a. With a very positive exercise ECG										
a1. Ejection fraction >50%	1 2 3 1 1 1 2 3 4 5 6 7 8 9 (7.0, 0.9, A)	2 2 1 1 1 1 2 3 4 5 6 7 8 9 (3.0, 1.1, I)	1 3 2 1 1 2 3 4 5 6 7 8 9 (7.0, 0.7, I)	2 2 2 1 1 1 2 3 4 5 6 7 8 9 (6.5, 1.1, I)	1 1 2 1 3 1 2 3 4 5 6 7 8 9 (3.5, 1.2, I)	2 4 1 1 2 3 4 5 6 7 8 9 (7.0, 0.6, I)	1 1 1 1 2 1 1 1 2 3 4 5 6 7 8 9 (5.5, 1.8, D)	1 3 2 2 1 2 3 4 5 6 7 8 9 (2.5, 0.9, A)	1 1 4 1 1 2 3 4 5 6 7 8 9 (7.0, 0.7, I)	(811-819)
a2. Ejection fraction 25-49%	2 2 3 1 1 2 3 4 5 6 7 8 9 (7.5, 0.9, A)	2 3 1 1 1 2 3 4 5 6 7 8 9 (4.0, 1.3, I)	1 3 2 1 1 2 3 4 5 6 7 8 9 (7.0, 0.9, I)	2 3 2 1 1 1 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.0, I)	1 2 3 4 5 6 7 8 9 (4.0, 1.4, I)	1 1 4 1 1 2 3 4 5 6 7 8 9 (7.0, 0.7, I)	1 1 2 1 2 1 1 3 1 3 1 2 3 4 5 6 7 8 9 (5.5, 1.8, D)	1 2 3 4 5 6 7 8 9 (2.5, 1.0, A)	2 4 1 1 2 3 4 5 6 7 8 9 (7.0, 0.9, I)	(820-828)
a3. Ejection fraction <25%	1 1 1 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.5, I)	2 2 2 1 1 2 3 4 5 6 7 8 9 (3.0, 1.1, I)	1 2 3 1 1 2 3 4 5 6 7 8 9 (8.0, 1.0, I)	2 1 1 1 2 1 1 1 2 2 1 1 1 2 3 4 5 6 7 8 9 (6.5, 1.9, D)	1 2 3 4 5 6 7 8 9 (3.5, 1.4, I)	1 1 3 1 1 1 2 3 4 5 6 7 8 9 (7.0, 0.9, I)	3 2 2 1 1 4 1 2 1 2 3 4 5 6 7 8 9 (5.0, 2.1, D)	1 2 3 4 5 6 7 8 9 (2.0, 0.8, A)	3 2 1 1 1 2 3 4 5 6 7 8 9 (7.0, 1.3, I)	(829-837)
b. With a negative to minimally positive exercise ECG										
b1. Ejection fraction >50%	1 1 3 1 2 1 2 3 4 5 6 7 8 9 (4.0, 1.9, D)	2 1 1 3 1 2 3 4 5 6 7 8 9 (3.0, 1.1, I)	1 2 1 1 1 1 1 2 3 4 5 6 7 8 9 (5.5, 1.9, I)	1 2 1 2 1 2 3 4 5 6 7 8 9 (4.0, 2.0, D)	2 2 2 1 1 1 2 3 4 5 6 7 8 9 (2.5, 1.1, I)	1 1 2 1 1 1 1 1 2 3 4 5 6 7 8 9 (4.5, 1.8, D)	3 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (2.5, 2.1, D)	4 1 2 1 1 2 3 4 5 6 7 8 9 (1.5, 1.0, A)	3 1 1 1 1 1 2 3 4 5 6 7 8 9 (4.5, 2.1, D)	(838-846)
b2. Ejection fraction 25-49%	1 1 1 2 1 2 1 2 3 4 5 6 7 8 9 (5.0, 2.0, D)	2 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (3.0, 1.6, I)	1 1 2 1 1 1 1 1 2 3 4 5 6 7 8 9 (5.5, 1.8, D)	2 2 1 1 2 3 1 2 1 2 3 4 5 6 7 8 9 (4.0, 2.4, D)	1 2 3 4 5 6 7 8 9 (2.0, 1.1, I)	1 1 1 3 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.5, D)	3 1 2 1 1 1 2 3 4 5 6 7 8 9 (2.5, 2.0, D)	3 3 1 1 1 2 3 4 5 6 7 8 9 (2.0, 0.8, A)	3 1 2 1 1 1 2 3 4 5 6 7 8 9 (4.5, 2.0, D)	(847-855)
b3. Ejection fraction <25%	1 1 1 3 2 1 2 3 4 5 6 7 8 9 (5.0, 1.8, D)	2 1 1 1 2 1 2 3 4 5 6 7 8 9 (3.0, 1.4, I)	1 3 2 1 1 1 2 3 4 5 6 7 8 9 (5.5, 2.1, I)	2 1 1 1 1 2 1 2 3 4 5 6 7 8 9 (4.5, 2.4, D)	2 3 1 2 1 2 3 4 5 6 7 8 9 (2.0, 1.1, I)	1 2 2 1 1 1 1 2 3 4 5 6 7 8 9 (4.0, 1.6, D)	4 2 1 1 1 2 3 4 5 6 7 8 9 (2.0, 2.1, D)	4 2 1 1 1 2 3 4 5 6 7 8 9 (1.5, 0.9, A)	2 1 1 2 1 1 1 2 3 4 5 6 7 8 9 (4.5, 1.9, D)	(856-864)
5. Single vessel disease - proximal left anterior descending										
a. With a very positive exercise ECG										
a1. Ejection fraction >50%	1 1 5 1 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	3 2 2 1 2 3 4 5 6 7 8 9 (5.0, 1.9, D)	1 6 1 1 2 3 4 5 6 7 8 9 (8.0, 0.2, A)	1 3 3 1 1 2 3 4 5 6 7 8 9 (7.5, 1.0, A)	1 1 1 1 2 2 1 2 3 4 5 6 7 8 9 (4.5, 1.8, D)	3 3 1 1 2 3 4 5 6 7 8 9 (8.0, 0.6, I)	1 1 4 1 1 2 1 2 2 1 1 2 3 4 5 6 7 8 9 (6.0, 1.4, I)	1 2 3 4 5 6 7 8 9 (3.0, 1.1, I)	2 2 3 1 1 2 3 4 5 6 7 8 9 (7.5, 0.9, A)	(865-873)
a2. Ejection fraction 25-49%	1 2 3 2 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	3 2 1 1 1 2 3 4 5 6 7 8 9 (5.0, 2.0, D)	1 1 5 1 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	1 1 2 2 2 1 1 1 1 2 1 1 1 2 3 4 5 6 7 8 9 (7.5, 1.2, I)	1 2 3 4 5 6 7 8 9 (4.5, 1.9, D)	1 3 2 1 1 2 3 4 5 6 7 8 9 (7.0, 0.7, I)	1 2 1 1 2 1 2 1 2 1 2 1 2 3 4 5 6 7 8 9 (5.5, 1.9, I)	1 2 3 4 5 6 7 8 9 (3.0, 1.2, I)	3 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 0.9, A)	(874-882)
a3. Ejection fraction <25%	1 1 1 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.8, I)	4 1 1 1 1 2 3 4 5 6 7 8 9 (2.0, 1.6, I)	1 1 4 2 1 2 3 4 5 6 7 8 9 (8.0, 1.0, I)	1 2 2 1 2 1 2 3 4 5 6 7 8 9 (7.0, 2.0, I)	1 3 2 1 1 1 2 3 4 5 6 7 8 9 (3.0, 1.8, I)	1 1 2 1 2 1 2 3 4 5 6 7 8 9 (7.0, 1.1, I)	2 1 1 1 2 3 3 2 1 1 1 1 2 3 4 5 6 7 8 9 (4.5, 2.5, D)	1 2 3 4 5 6 7 8 9 (2.0, 1.2, I)	1 3 1 2 1 1 2 3 4 5 6 7 8 9 (6.5, 1.1, A)	(883-891)
b. With a negative to minimally positive exercise ECG										
b1. Ejection fraction >50%	1 1 1 2 1 2 1 2 3 4 5 6 7 8 9 (5.0, 1.8, D)	1 3 1 1 2 3 4 5 6 7 8 9 (2.0, 1.4, I)	1 3 1 1 1 1 1 2 3 4 5 6 7 8 9 (5.5, 1.4, I)	1 2 2 1 2 1 2 3 4 5 6 7 8 9 (5.0, 1.8, D)	1 1 2 3 1 2 3 4 5 6 7 8 9 (4.0, 1.1, I)	1 3 2 1 1 1 2 3 4 5 6 7 8 9 (5.5, 1.1, A)	1 1 1 2 1 1 1 1 2 3 4 5 6 7 8 9 (4.0, 1.8, D)	3 2 2 1 1 2 3 4 5 6 7 8 9 (2.0, 0.9, A)	1 1 2 1 2 1 1 2 3 4 5 6 7 8 9 (5.5, 1.5, I)	(892-900)
b2. Ejection fraction 25-49%	1 1 1 3 2 1 2 3 4 5 6 7 8 9 (6.0, 1.6, D)	1 3 1 2 1 2 3 4 5 6 7 8 9 (2.0, 1.7, I)	2 1 2 1 1 1 1 2 3 4 5 6 7 8 9 (6.0, 1.4, I)	1 1 1 2 1 2 1 2 3 4 5 6 7 8 9 (5.0, 1.6, D)	1 1 1 3 1 1 2 3 4 5 6 7 8 9 (5.0, 1.3, I)	1 3 2 1 1 1 2 3 4 5 6 7 8 9 (5.5, 1.1, A)	1 1 1 3 2 1 2 3 4 5 6 7 8 9 (4.0, 1.5, D)	3 2 1 2 1 2 3 4 5 6 7 8 9 (2.0, 1.0, I)	1 1 3 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.4, I)	(901-909)
b3. Ejection fraction <25%	1 1 2 1 1 2 1 2 3 4 5 6 7 8 9 (4.5, 2.2, D)	2 3 1 1 1 2 3 4 5 6 7 8 9 (2.0, 1.3, I)	2 1 1 1 2 3 4 5 6 7 8 9 (5.5, 2.4, D)	1 1 2 1 1 2 1 2 3 4 5 6 7 8 9 (4.5, 2.1, D)	2 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (3.0, 1.6, I)	1 1 2 2 1 1 1 2 3 4 5 6 7 8 9 (5.5, 1.6, I)	2 2 1 1 1 1 1 2 3 4 5 6 7 8 9 (2.5, 1.9, I)	3 3 1 1 1 2 3 4 5 6 7 8 9 (2.0, 1.0, I)	1 3 1 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.8, I)	(910-918)

aptar 1

HONIC STABLE ANGINA

	NORMAL OR LOW RISK			MODERATELY HIGH RISK			VERY HIGH RISK			
	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	
6. Single vessel disease - any vessel other than PLAD										
a. With a very positive exercise ECG										
a1. Ejection fraction >50%	1 1 1 1 3 1 1 2 3 4 5 6 7 8 9 (7.5, 2.1, D)	3 1 3 1 1 2 3 4 5 6 7 8 9 (2.5, 1.0, A)	1 1 2 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.6, I)	1 1 1 1 1 2 1 3 2 3 1 2 3 4 5 6 7 8 9 (5.5, 2.4, D)	1 2 3 4 5 6 7 8 9 (2.0, 0.8, A)	1 1 2 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.6, I)	3 1 1 2 1 5 2 1 1 2 3 4 5 6 7 8 9 (2.5, 2.4, I)	1 2 3 4 5 6 7 8 9 (1.0, 0.5, A)	1 1 2 2 1 1 1 2 3 4 5 6 7 8 9 (6.5, 1.6, I)	(919-927)
a2. Ejection fraction 25-49%	1 2 1 3 1 1 2 3 4 5 6 7 8 9 (6.5, 2.2, I)	3 1 4 1 2 3 4 5 6 7 8 9 (2.5, 0.9, A)	1 1 1 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.8, I)	1 1 2 1 2 1 3 3 2 1 2 3 4 5 6 7 8 9 (5.0, 2.5, D)	1 2 3 4 5 6 7 8 9 (2.0, 0.6, A)	1 1 1 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.8, I)	3 2 2 1 5 2 1 1 2 3 4 5 6 7 8 9 (2.0, 2.2, I)	1 2 3 4 5 6 7 8 9 (1.0, 0.5, A)	1 3 1 1 1 1 2 3 4 5 6 7 8 9 (6.0, 1.5, I)	(928-936)
a3. Ejection fraction <25%	2 1 2 2 1 4 2 2 1 2 3 4 5 6 7 8 9 (4.0, 2.2, D)	1 2 3 4 5 6 7 8 9 (1.5, 0.8, A)	1 2 2 1 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.9, I)	1 2 1 1 1 1 1 5 2 1 1 2 3 4 5 6 7 8 9 (3.5, 2.4, D)	1 2 3 4 5 6 7 8 9 (1.0, 0.5, A)	1 2 1 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.9, I)	5 1 1 1 6 1 1 1 2 3 4 5 6 7 8 9 (1.0, 1.8, I)	1 2 3 4 5 6 7 8 9 (1.0, 0.4, A)	1 2 2 1 1 1 1 2 3 4 5 6 7 8 9 (6.0, 1.6, I)	(937-945)
b. With a negative to minimally positive exercise ECG										
b1. Ejection fraction >50%	3 1 1 1 2 1 2 3 4 5 6 7 8 9 (2.5, 2.4, D)	5 2 1 1 2 3 4 5 6 7 8 9 (1.0, 0.5, A)	2 2 2 1 1 1 2 3 4 5 6 7 8 9 (5.0, 2.4, D)	4 1 1 2 5 2 1 1 2 3 4 5 6 7 8 9 (2.0, 2.4, D)	1 2 3 4 5 6 7 8 9 (1.0, 0.5, A)	2 1 1 1 1 1 2 3 4 5 6 7 8 9 (5.0, 2.6, D)	4 1 1 1 6 1 1 1 2 3 4 5 6 7 8 9 (1.5, 1.9, I)	1 2 3 4 5 6 7 8 9 (1.0, 0.4, A)	2 2 2 1 1 1 2 3 4 5 6 7 8 9 (4.5, 2.5, D)	(946-954)
b2. Ejection fraction 25-49%	3 2 1 2 1 2 3 4 5 6 7 8 9 (2.0, 2.1, D)	5 2 1 1 2 3 4 5 6 7 8 9 (1.0, 0.5, A)	2 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (4.5, 2.4, D)	4 1 1 2 5 2 1 1 2 3 4 5 6 7 8 9 (1.5, 2.1, D)	1 2 3 4 5 6 7 8 9 (1.0, 0.5, A)	2 1 2 1 1 1 2 3 4 5 6 7 8 9 (5.0, 2.4, D)	4 2 1 1 6 1 1 1 2 3 4 5 6 7 8 9 (1.5, 1.6, I)	1 2 3 4 5 6 7 8 9 (1.0, 0.4, A)	2 2 1 1 1 1 2 3 4 5 6 7 8 9 (4.0, 2.4, D)	(955-963)
b3. Ejection fraction <25%	3 3 2 1 2 3 4 5 6 7 8 9 (2.0, 1.9, D)	6 1 1 1 2 3 4 5 6 7 8 9 (1.0, 0.4, A)	2 1 2 1 1 1 2 3 4 5 6 7 8 9 (4.0, 2.2, D)	4 2 2 6 1 1 1 2 3 4 5 6 7 8 9 (1.5, 2.0, D)	1 2 3 4 5 6 7 8 9 (1.0, 0.4, A)	2 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (4.0, 2.4, D)	5 1 2 6 1 1 1 2 3 4 5 6 7 8 9 (1.0, 1.4, I)	1 2 3 4 5 6 7 8 9 (1.0, 0.4, A)	2 2 1 1 1 1 2 3 4 5 6 7 8 9 (3.5, 2.2, D)	(964-972)

apter 2

STABLE ANGINA

RESISTENT SYMPTOMS ON MEDICAL THERAPY	NORMAL OR LOW RISK			MODERATELY HIGH RISK			VERY HIGH RISK			
	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	
LEFT MAIN DISEASE										
1. Ejection fraction >50%	8 1 2 3 4 5 6 7 8 9 (9.0, 0.0, A)	1 7 1 2 3 4 5 6 7 8 9 (9.0, 0.1, A)	1 1 1 2 7 1 2 3 4 5 6 7 8 9 (6.5, 2.1, D)	1 7 1 2 3 4 5 6 7 8 9 (9.0, 0.1, A)	2 6 1 2 3 4 5 6 7 8 9 (9.0, 0.2, A)	1 1 1 1 2 2 1 2 3 4 5 6 7 8 9 (6.5, 2.0, I)	5 3 1 2 3 4 5 6 7 8 9 (8.0, 0.4, A)	1 2 3 2 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	1 2 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.5, I)	(1- 9)
2. Ejection fraction 25-49%	8 1 2 3 4 5 6 7 8 9 (9.0, 0.0, A)	1 7 1 2 3 4 5 6 7 8 9 (9.0, 0.1, A)	1 1 1 2 7 1 2 3 4 5 6 7 8 9 (6.5, 2.1, D)	1 7 1 2 3 4 5 6 7 8 9 (9.0, 0.2, A)	1 1 6 1 2 3 4 5 6 7 8 9 (9.0, 0.4, A)	1 1 1 1 2 2 1 2 3 4 5 6 7 8 9 (6.5, 2.0, I)	1 4 3 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	1 2 3 2 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	1 1 1 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.6, I)	(10- 18)
3. Ejection fraction <25%	1 7 1 2 3 4 5 6 7 8 9 (9.0, 0.8, A)	1 1 6 1 2 3 4 5 6 7 8 9 (9.0, 0.9, A)	1 1 1 1 2 7 1 2 3 4 5 6 7 8 9 (6.5, 2.1, D)	1 1 5 1 2 3 4 5 6 7 8 9 (9.0, 1.2, I)	1 1 2 4 1 2 3 4 5 6 7 8 9 (8.5, 1.4, I)	1 1 1 1 2 2 1 2 3 4 5 6 7 8 9 (6.5, 2.0, I)	1 1 1 4 1 2 3 4 5 6 7 8 9 (8.5, 1.6, I)	1 1 2 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.6, I)	2 1 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.8, D)	(19- 27)
THREE VESSEL DISEASE										
1. Ejection fraction >50%	1 6 1 2 3 4 5 6 7 8 9 (9.0, 0.1, I)	1 1 2 4 1 2 3 4 5 6 7 8 9 (8.5, 1.6, I)	2 1 5 1 2 3 4 5 6 7 8 9 (9.0, 0.6, A)	3 5 1 2 3 4 5 6 7 8 9 (9.0, 0.4, A)	1 2 2 3 1 2 3 4 5 6 7 8 9 (8.0, 1.0, A)	1 3 4 1 2 3 4 5 6 7 8 9 (8.0, 1.4, A)	4 1 3 1 2 3 4 5 6 7 8 9 (7.5, 0.9, A)	1 3 1 1 1 1 1 2 3 4 5 6 7 8 9 (5.5, 1.4, I)	3 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	(28- 36)
2. Ejection fraction 25-49%	1 6 1 2 3 4 5 6 7 8 9 (9.0, 0.1, I)	1 1 1 4 1 2 3 4 5 6 7 8 9 (8.5, 1.8, I)	2 1 5 1 2 3 4 5 6 7 8 9 (9.0, 0.6, A)	1 2 5 1 2 3 4 5 6 7 8 9 (9.0, 0.5, A)	3 1 3 1 2 3 4 5 6 7 8 9 (7.5, 1.1, A)	1 3 4 1 2 3 4 5 6 7 8 9 (8.0, 1.4, A)	1 3 1 3 1 2 3 4 5 6 7 8 9 (7.5, 1.0, A)	1 3 1 2 1 1 2 3 4 5 6 7 8 9 (5.5, 1.5, I)	3 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	(37- 45)
3. Ejection fraction <25%	1 1 1 5 1 2 3 4 5 6 7 8 9 (9.0, 1.4, I)	1 1 1 3 1 2 3 4 5 6 7 8 9 (7.5, 2.2, I)	2 1 1 4 1 2 3 4 5 6 7 8 9 (8.5, 1.4, I)	1 1 1 5 1 2 3 4 5 6 7 8 9 (9.0, 1.6, I)	1 1 1 1 1 3 1 2 3 4 5 6 7 8 9 (7.5, 1.8, I)	1 2 4 1 2 3 4 5 6 7 8 9 (9.0, 1.0, I)	1 1 4 1 2 3 4 5 6 7 8 9 (9.0, 1.6, I)	1 1 1 2 1 1 2 3 4 5 6 7 8 9 (6.0, 2.1, D)	3 2 2 1 2 3 4 5 6 7 8 9 (8.0, 0.7, I)	(46- 54)
TWO VESSEL DISEASE WITH PROXIMAL LEFT ANTERIOR DESCENDING INVOLVEMENT										
1. Ejection fraction >50%	2 6 1 2 3 4 5 6 7 8 9 (9.0, 0.2, A)	1 2 4 1 1 2 3 4 5 6 7 8 9 (7.0, 1.0, A)	4 4 1 2 3 4 5 6 7 8 9 (8.5, 0.5, A)	4 4 1 2 3 4 5 6 7 8 9 (8.5, 0.5, A)	1 1 2 3 1 1 2 3 4 5 6 7 8 9 (6.5, 1.2, A)	2 3 3 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	3 3 1 1 1 2 3 4 5 6 7 8 9 (7.0, 0.8, A)	1 1 4 1 1 2 3 4 5 6 7 8 9 (5.0, 1.1, I)	1 1 3 3 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	(55- 63)
2. Ejection fraction 25-49%	3 5 1 2 3 4 5 6 7 8 9 (9.0, 0.4, A)	1 1 4 1 1 1 2 3 4 5 6 7 8 9 (7.0, 1.1, A)	4 4 1 2 3 4 5 6 7 8 9 (8.5, 0.5, A)	1 3 4 1 2 3 4 5 6 7 8 9 (8.5, 0.6, A)	1 1 1 3 1 1 1 2 3 4 5 6 7 8 9 (7.0, 1.4, I)	2 3 3 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	1 1 3 2 1 1 2 3 4 5 6 7 8 9 (7.0, 0.9, A)	1 1 2 3 1 1 2 3 4 5 6 7 8 9 (5.0, 1.9, I)	3 3 1 2 3 4 5 6 7 8 9 (8.0, 0.9, I)	(64- 72)
3. Ejection fraction <25%	1 1 1 5 1 2 3 4 5 6 7 8 9 (9.0, 1.1, A)	1 1 1 1 4 1 2 3 4 5 6 7 8 9 (7.0, 2.0, D)	3 1 4 1 2 3 4 5 6 7 8 9 (8.5, 0.9, A)	1 1 5 1 2 3 4 5 6 7 8 9 (9.0, 1.4, I)	1 1 1 2 1 2 1 2 3 4 5 6 7 8 9 (6.0, 1.6, D)	2 1 1 4 1 2 3 4 5 6 7 8 9 (8.5, 1.1, I)	1 1 1 3 1 1 1 2 3 4 5 6 7 8 9 (7.0, 1.5, I)	1 3 1 3 1 2 3 4 5 6 7 8 9 (2.5, 2.1, D)	1 3 1 3 1 2 3 4 5 6 7 8 9 (7.5, 1.0, A)	(73- 81)
TWO VESSEL DISEASE WITHOUT PROXIMAL LEFT ANTERIOR DESCENDING INVOLVEMENT										
1. Ejection fraction >50%	3 5 1 2 3 4 5 6 7 8 9 (9.0, 0.4, A)	1 1 5 1 1 2 3 4 5 6 7 8 9 (5.0, 0.6, A)	5 3 1 2 3 4 5 6 7 8 9 (8.0, 0.4, A)	1 3 4 1 2 3 4 5 6 7 8 9 (8.5, 0.6, A)	1 1 1 5 1 2 3 4 5 6 7 8 9 (5.0, 0.8, A)	1 3 3 1 2 3 4 5 6 7 8 9 (8.0, 0.6, I1	1 5 1 1 1 2 3 4 5 6 7 8 9 (7.0, 0.6, A)	1 3 3 1 1 2 3 4 5 6 7 8 9 (3.0, 1.2, A)	6 2 1 2 3 4 5 6 7 8 9 (8.0, 0.2, A)	(82- 90)
2. Ejection fraction 25-49%	3 5 1 2 3 4 5 6 7 8 9 (9.0, 0.4, A)	1 1 3 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.1, A)	5 3 1 2 3 4 5 6 7 8 9 (8.0, 0.4, A)	4 4 1 2 3 4 5 6 7 8 9 (8.5, 0.5, A)	1 2 3 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.1, A)	1 3 3 1 2 3 4 5 6 7 8 9 (8.0, 0.6, I1	1 4 2 1 1 2 3 4 5 6 7 8 9 (7.0, 0.8, A)	1 2 2 1 1 1 2 3 4 5 6 7 8 9 (3.0, 1.4, I)	2 4 2 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	(91- 99)
3. Ejection fraction <25	1 2 5 1 2 3 4 5 6 7 8 9 (9.0, 1.0, A)	2 3 1 2 1 2 3 4 5 6 7 8 9 (5.0, 1.4, D)	1 3 4 1 2 3 4 5 6 7 8 9 (8.5, 0.6, A)	1 2 5 1 1 1 2 3 4 5 6 7 8 9 (9.0, 1.2, A)	1 3 2 1 2 3 4 5 6 7 8 9 (5.0, 1.5, D)	1 1 1 4 1 2 3 4 5 6 7 8 9 (9.0, 0.9, I1	2 1 1 2 1 1 2 3 4 5 6 7 8 9 (6.5, 1.6, I)	2 3 2 1 1 2 3 4 5 6 7 8 9 (2.0, 1.0, A)	2 3 3 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	(100-108)

pter 2

TABLE ANGINA

	NORMAL OR LOW RISK			MODERATELY HIGH RISK			VERY HIGH RISK			
	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	
INGLE VESSEL DISEASE - PROXIMAL LEFT NTERIOR DESCENDING										
. Ejection fraction >50%	1 1 6 1 2 3 4 5 6 7 8 9 (9.0, 0.4, A)	1 4 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.4, A)	3 5 1 2 3 4 5 6 7 8 9 (9.0, 0.4, A)	1 4 3 1 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	1 3 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.1, A)	3 5 1 2 3 4 5 6 7 8 9 (9.0, 0.4, A)	1 1 2 2 1 1 1 2 3 4 5 6 7 8 9 (6.5, 1.4, I)	2 1 3 1 1 1 2 3 4 5 6 7 8 9 (3.0, 1.0, I)	1 3 4 1 2 3 4 5 6 7 8 9 (8.5, 0.6, A)	(109-117)
. Ejection fraction 25-49%	3 5 1 2 3 4 5 6 7 8 9 (9.0, 0.4, A)	1 4 1 2 1 2 3 4 5 6 7 8 9 (5.0, 1.5, I)	3 5 1 2 3 4 5 6 7 8 9 (9.0, 0.4, A)	5 3 1 2 2 1 2 1 2 3 4 5 6 7 8 9 (8.0, 0.4, A)	1 2 3 4 5 6 7 8 9 (5.0, 1.4, I)	3 5 1 2 3 4 5 6 7 8 9 (9.0, 0.4, A)	3 1 3 1 2 1 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.5, I)	1 2 3 4 5 6 7 8 9 (3.0, 1.1, I)	4 4 1 2 3 4 5 6 7 8 9 (8.5, 0.5, A)	(118-126)
. Ejection fraction <25%	1 3 4 1 2 3 4 5 6 7 8 9 (8.5, 1.1, A)	1 1 4 1 2 3 4 5 6 7 8 9 (5.0, 1.4, D)	3 5 1 2 3 4 5 6 7 8 9 (9.0, 0.4, A)	1 2 1 4 1 3 2 1 1 1 2 3 4 5 6 7 8 9 (8.5, 1.4, A)	1 2 3 4 5 6 7 8 9 (4.0, 1.6, I)	3 5 1 2 3 4 5 6 7 8 9 (9.0, 0.4, A)	2 2 1 1 2 3 2 1 1 1 1 2 3 4 5 6 7 8 9 (5.0, 2.2, D)	1 2 3 4 5 6 7 8 9 (2.0, 1.1, I)	3 5 1 2 3 4 5 6 7 8 9 (9.0, 0.4, A)	(127-135)
INGLE VESSEL DISEASE - ANY VESSEL THER THAN PLAD										
. Ejection fraction >50%	1 2 3 2 2 1 3 1 1 1 2 3 4 5 6 7 8 9 (8.0, 0.9, A)	1 3 2 1 3 1 1 1 1 2 3 4 5 6 7 8 9 (3.0, 1.0, I)	1 4 3 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	1 1 3 2 1 3 1 3 1 1 2 3 4 5 6 7 8 9 (7.0, 0.9, A)	1 2 3 4 5 6 7 8 9 (2.5, 1.1, A)	5 3 1 2 3 4 5 6 7 8 9 (8.0, 0.4, A)	1 1 2 1 1 1 1 4 3 1 1 2 3 4 5 6 7 8 9 (4.5, 2.0, D)	1 2 3 4 5 6 7 8 9 (1.5, 0.8, A)	1 5 2 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	(136-144)
Ejection fraction 25-49%	1 2 2 3 2 1 3 1 1 1 2 3 4 5 6 7 8 9 (8.0, 1.0, A)	1 1 3 1 2 3 1 2 1 1 1 2 3 4 5 6 7 8 9 (3.0, 1.0, I)	5 3 1 2 3 4 5 6 7 8 9 (8.0, 0.4, A)	1 2 3 4 5 6 7 8 9 (7.0, 1.0, I)	1 2 3 4 5 6 7 8 9 (2.5, 1.2, I)	5 3 1 2 3 4 5 6 7 8 9 (8.0, 0.4, A)	1 1 2 1 1 1 1 3 3 1 1 1 2 3 4 5 6 7 8 9 (4.5, 2.1, D)	1 2 3 4 5 6 7 8 9 (2.0, 0.8, A)	1 5 2 1 2 3 4 5 6 7 8 9 (8.0, 0.4, A)	(145-153)
. Ejection fraction <25%	1 1 1 1 1 1 4 1 1 1 1 1 2 3 4 5 6 7 8 9 (7.5, 1.8, I)	1 2 3 4 5 6 7 8 9 (1.5, 1.2, I)	1 3 4 1 2 3 4 5 6 7 8 9 (8.5, 0.6, A)	1 2 1 1 2 1 4 1 2 1 1 2 3 4 5 6 7 8 9 (6.5, 1.6, I)	1 2 3 4 5 6 7 8 9 (1.5, 1.1, A)	1 3 4 1 2 3 4 5 6 7 8 9 (8.5, 0.6, A)	1 1 2 2 1 4 2 1 1 1 2 3 4 5 6 7 8 9 (3.5, 1.8, I)	1 2 3 4 5 6 7 8 9 (1.5, 0.9, A)	6 2 1 2 3 4 5 6 7 8 9 (8.0, 0.2, A)	(154-162)

apter 2

STABLE ANGINA

SYMPTOMS ON MEDICAL THERAPY (NOT EVIOUSLY RECEIVING MAXIMUM MEDICAL THERAPY)	NORMAL OR LOW RISK			MODERATELY HIGH RISK			VERY HIGH RISK			
	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	
LEFT MAIN DISEASE										
1. Ejection fraction >50%	8 1 2 3 4 5 6 7 8 9 (9.0, 0.0, A)	1 7 1 2 3 4 5 6 7 8 9 (9.0, 0.1, A)	1 1 2 1 1 1 1 1 2 3 4 5 6 7 8 9 (3.5, 2.1, D)	1 7 1 2 3 4 5 6 7 8 9 (9.0, 0.1, A)	1 7 1 2 3 4 5 6 7 8 9 (9.0, 0.4, A)	1 1 1 2 1 1 1 1 2 3 4 5 6 7 8 9 (3.0, 2.3, D)	1 2 1 4 1 2 3 4 5 6 7 8 9 (8.5, 1.0, A)	1 2 3 2 1 2 3 4 5 6 7 8 9 (8.0, 1.1, I)	2 2 2 1 1 1 2 3 4 5 6 7 8 9 (4.0, 1.8, I)	(163-171)
2. Ejection fraction 25-49%	8 1 2 3 4 5 6 7 8 9 (9.0, 0.0, A)	1 7 1 2 3 4 5 6 7 8 9 (9.0, 0.1, A)	1 1 2 1 1 1 1 1 2 3 4 5 6 7 8 9 (3.5, 2.1, D)	1 7 1 2 3 4 5 6 7 8 9 (9.0, 0.1, A)	1 1 6 1 2 3 4 5 6 7 8 9 (9.0, 0.5, A)	1 1 1 2 1 1 1 1 2 3 4 5 6 7 8 9 (3.0, 2.3, D)	3 1 4 1 2 3 4 5 6 7 8 9 (8.5, 0.9, A)	2 2 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.0, I)	2 2 2 1 1 1 2 3 4 5 6 7 8 9 (4.0, 1.9, D)	(172-180)
3. Ejection fraction <25%	1 1 6 1 2 3 4 5 6 7 8 9 (9.0, 1.0, A)	1 2 1 4 1 2 3 4 5 6 7 8 9 (8.5, 1.4, A)	1 1 2 1 1 1 1 1 2 3 4 5 6 7 8 9 (3.5, 2.1, D)	1 1 6 1 2 3 4 5 6 7 8 9 (9.0, 1.0, A)	1 1 2 4 1 2 3 4 5 6 7 8 9 (8.0, 1.6, I)	1 1 2 1 2 1 2 3 4 5 6 7 8 9 (3.0, 2.4, D)	1 1 1 2 3 1 2 3 4 5 6 7 8 9 (8.0, 1.4, I)	1 3 2 2 1 2 3 4 5 6 7 8 9 (7.0, 1.8, I)	2 2 2 2 1 2 3 4 5 6 7 8 9 (4.0, 2.0, D)	(181-189)
THREE VESSEL DISEASE										
1. Ejection fraction >50%	2 5 1 2 3 4 5 6 7 8 9 (9.0, 0.3, I)	2 1 3 2 1 2 3 4 5 6 7 8 9 (8.0, 1.2, I)	1 1 1 3 2 1 2 3 4 5 6 7 8 9 (8.0, 1.6, I)	1 4 3 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	2 2 1 2 1 1 2 3 4 5 6 7 8 9 (6.5, 1.2, I)	1 2 1 3 1 2 3 4 5 6 7 8 9 (8.0, 1.3, I)	2 1 3 1 1 1 2 3 4 5 6 7 8 9 (7.0, 1.0, I)	1 1 5 1 1 2 3 4 5 6 7 8 9 (5.0, 0.9, A)	1 3 1 1 1 2 3 4 5 6 7 3 9 (7.0, 1.0, I)	(190-198)
2. Ejection fraction 25-49%	4 4 1 2 3 4 5 6 7 8 9 (8.5, 0.5, A)	2 2 1 3 1 2 3 4 5 6 7 8 9 (7.5, 1.4, I)	1 1 3 3 1 2 3 4 5 6 7 8 9 (8.0, 1.0, A)	1 3 4 1 2 3 4 5 6 7 8 9 (8.5, 0.6, A)	2 2 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.2, I)	1 1 1 1 3 1 2 3 4 5 6 7 8 9 (8.0, 1.4, I)	1 2 2 1 2 1 2 3 4 5 6 7 8 9 (7.0, 1.1, I)	1 1 4 1 1 1 2 3 4 5 6 7 8 9 (5.0, 0.9, A)	1 3 1 2 1 2 3 4 5 6 7 8 9 (7.0, 1.1, I)	(199-207)
3. Ejection fraction <25%	1 1 1 5 1 2 3 4 5 6 7 8 9 (9.0, 1.6, I)	1 3 1 3 1 2 3 4 5 6 7 8 9 (6.5, 2.1, I)	1 1 1 1 4 1 2 3 4 5 6 7 8 9 (8.5, 1.5, I)	1 2 5 1 2 3 4 5 6 7 8 9 (9.0, 1.5, I)	1 2 1 2 2 1 2 3 4 5 6 7 8 9 (7.0, 1.9, I)	1 2 4 1 2 3 4 5 6 7 8 9 (9.0, 1.9, I)	1 3 1 2 1 1 2 3 4 5 6 7 8 9 (6.0, 1.9, I)	1 1 3 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.4, I)	1 1 2 1 2 1 2 3 4 5 6 7 8 9 (7.0, 1.4, I)	(208-216)
TWO VESSEL DISEASE WITH PROXIMAL LEFT ANTERIOR DESCENDING INVOLVEMENT										
1. With a very positive exercise ECG										
a. Ejection fraction >50%	3 5 1 2 3 4 5 6 7 8 9 (9.0, 0.4, A)	1 4 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.1, A)	2 1 5 1 2 3 4 5 6 7 8 9 (9.0, 0.6, A)	1 5 2 1 2 3 4 5 6 7 8 9 (8.0, 0.4, A)	1 1 3 1 2 1 2 3 4 5 6 7 8 9 (5.0, 1.0, I)	3 1 4 1 2 3 4 5 6 7 8 9 (8.5, 0.9, A)	3 1 1 2 1 1 2 3 4 5 6 7 8 9 (6.5, 1.4, I)	1 1 1 4 1 1 2 3 4 5 6 7 8 9 (5.0, 1.2, I)	2 5 1 1 2 3 4 5 6 7 8 9 (8.0, 0.4, A)	(217-225)
b. Ejection fraction 25-49%	1 2 5 1 2 3 4 5 6 7 8 9 (9.0, 0.5, A)	1 2 2 1 2 1 2 3 4 5 6 7 8 9 (6.0, 1.2, I)	1 3 4 1 2 3 4 5 6 7 8 9 (8.5, 0.8, A)	1 4 3 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	1 2 2 3 1 2 3 4 5 6 7 8 9 (6.0, 1.0, A)	2 2 4 1 2 3 4 5 6 7 8 9 (8.5, 1.0, I)	1 1 1 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.2, I)	1 2 3 2 1 2 3 4 5 6 7 8 9 (5.0, 1.2, I)	1 1 5 1 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	(226-234)
c. Ejection fraction <25%	1 1 1 4 1 2 3 4 5 6 7 8 9 (8.5, 1.8, I)	2 1 1 2 1 1 1 2 3 4 5 6 7 8 9 (6.0, 2.0, D)	1 1 2 4 1 2 3 4 5 6 7 8 9 (8.5, 1.1, A)	1 1 1 2 3 1 2 3 4 5 6 7 8 9 (8.0, 1.8, I)	1 1 1 1 3 1 1 2 3 4 5 6 7 8 9 (6.0, 1.9, D)	2 1 1 4 1 2 3 4 5 6 7 8 9 (8.5, 1.4, I)	2 1 1 1 1 2 1 2 3 4 5 6 7 8 9 (6.5, 2.2, D)	2 1 2 1 2 1 2 3 4 5 6 7 8 9 (4.0, 1.8, D)	1 1 1 3 2 1 2 3 4 5 6 7 8 9 (8.0, 1.0, I)	(235-243)
2. With a negative to minimally positive exercise ECG										
a. Ejection fraction >50%	2 4 2 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	1 4 3 1 2 3 4 5 6 7 8 9 (5.0, 1.0, A)	1 1 1 2 3 1 2 3 4 5 6 7 8 9 (8.0, 1.4, I)	2 1 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	2 4 1 1 1 2 3 4 5 6 7 8 9 (5.0, 0.9, I)	1 1 2 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.2, I)	1 2 1 2 2 1 2 3 4 5 6 7 8 9 (6.5, 1.5, I)	1 3 3 1 1 2 3 4 5 6 7 8 9 (3.5, 0.9, A)	1 2 3 1 1 1 2 3 4 5 6 7 8 9 (7.0, 1.1, A)	(244-252)
b. Ejection fraction 25-49%	1 1 4 2 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	1 2 2 3 1 2 3 4 5 6 7 8 5 (6.0, 1.0, A)	1 1 1 3 2 1 2 3 4 5 6 7 8 9 (8.0, 1.4, I)	1 1 3 1 2 1 2 3 4 5 6 7 8 9 (7.0, 1.0, I)	1 2 2 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.0, A)	2 1 1 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.4, I)	1 1 2 2 2 1 2 3 4 5 6 7 8 9 (6.5, 1.5, I)	1 2 2 3 1 2 3 4 5 6 7 8 9 (4.0, 1.0, A)	1 1 4 1 1 1 2 3 4 5 6 7 8 9 (7.0, 1.1, I)	(253-261)
c. Ejection fraction <25%	1 1 1 3 2 1 2 3 4 5 6 7 8 9 (8.0, 1.6, I)	1 1 1 1 4 1 2 3 4 5 6 7 8 9 (6.0, 1.8, D)	2 1 3 2 1 2 3 4 5 6 7 8 9 (8.0, 1.6, D)	2 1 2 1 2 1 2 3 4 5 6 7 8 9 (7.0, 1.8, D)	1 2 2 1 2 1 2 3 4 5 6 7 8 9 (5.0, 1.5, D)	1 2 1 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.9, I)	2 1 2 1 2 1 2 3 4 5 6 7 8 9 (6.0, 2.0, D)	1 2 1 1 2 1 1 2 3 4 5 6 7 8 9 (3.5, 1.5, I)	1 1 1 4 1 1 2 3 4 5 6 7 8 9 (7.0, 1.2, I)	(262-270)

pter 2

TABLE ANGINA

	NORMAL OR LOW RISK			MODERATELY HIGH RISK			VERY HIGH RISK			
	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	
TWO VESSEL DISEASE WITHOUT PROXIMAL LEFT ANTERIOR DESCENDING INVOLVEMENT										
1. With a very positive exercise ECG										
a. Ejection fraction >50%	1 2 2 2 1 1 2 3 4 5 6 7 8 9 (8.0, 1.0, I)	1 1 3 2 1 1 2 3 4 5 6 7 8 9 (4.0, 1.1, A)	2 1 2 3 1 2 3 4 5 6 7 8 9 (8.0, 1.0, I)	1 2 4 1 1 2 3 4 5 6 7 8 9 (8.0, 1.0, A)	1 1 2 2 1 1 1 2 3 4 5 6 7 8 9 (3.5, 1.4, I)	2 1 3 2 1 2 3 4 5 6 7 8 9 (8.0, 0.9, I)	1 1 2 2 1 1 1 2 3 4 5 6 7 8 9 (5.5, 1.5, I)	2 1 2 1 2 1 2 3 4 5 6 7 8 9 (3.0, 1.2, I)	4 2 1 1 1 2 3 4 5 6 7 8 9 (6.5, 0.9, A)	(271-279)
b. Ejection fraction 25-49%	2 1 3 2 1 1 2 3 4 5 6 7 8 9 (8.0, 0.9, I)	1 1 3 2 1 1 2 3 4 5 6 7 8 9 (4.0, 1.1, A)	1 1 4 2 1 2 3 4 5 6 7 8 9 (8.0, 0.9, I)	1 1 1 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.9, A)	1 1 3 1 1 1 2 3 4 5 6 7 8 9 (3.0, 1.2, I)	1 1 4 2 1 2 3 4 5 6 7 8 9 (8.0, 0.9, I)	2 1 2 2 1 1 2 3 4 5 6 7 8 9 (6.0, 1.6, D)	2 2 1 1 2 1 2 3 4 5 6 7 8 9 (2.5, 1.4, I)	2 1 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.1, I)	(280-288)
c. Ejection fraction <25%	1 1 5 1 1 1 2 3 4 5 6 7 8 9 (8.0, 1.4, I)	1 1 4 1 1 1 2 3 4 5 6 7 8 9 (4.0, 1.0, A)	1 1 2 3 1 2 3 4 5 6 7 8 9 (8.0, 1.8, I)	1 1 1 4 1 1 1 2 3 4 5 6 7 8 9 (8.0, 1.6, D)	1 1 4 1 1 1 2 3 4 5 6 7 8 9 (3.0, 1.1, I)	1 1 1 1 3 1 2 3 4 5 6 7 8 9 (7.5, 1.8, I)	1 1 1 3 1 1 2 3 4 5 6 7 8 9 (6.0, 2.2, D)	2 2 1 1 2 1 2 3 4 5 6 7 8 9 (2.5, 1.4, I)	1 2 4 1 1 2 3 4 5 6 7 8 9 (7.0, 1.2, A)	(289-297)
2. With a negative to minimally positive exercise ECG										
a. Ejection fraction >50%	1 1 2 2 2 1 2 3 4 5 6 7 8 9 (5.5, 1.6, D)	1 4 1 2 1 2 3 4 5 6 7 8 9 (3.0, 0.8, A)	1 2 2 1 2 1 2 3 4 5 6 7 8 9 (6.0, 1.6, I)	1 2 1 1 2 1 2 3 4 5 6 7 8 9 (5.0, 1.7, I)	1 3 1 2 1 1 2 3 4 5 6 7 8 9 (2.5, 1.1, A)	1 1 1 2 1 1 1 1 2 3 4 5 6 7 8 9 (6.0, 1.5, I)	2 1 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (3.5, 2.2, D)	2 2 2 1 1 1 2 3 4 5 6 7 8 9 (2.5, 1.1, I)	2 1 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (5.5, 1.9, D)	(298-306)
b. Ejection fraction 25-49%	1 3 1 1 2 1 2 3 4 5 6 7 8 9 (5.5, 1.5, I)	1 3 2 1 1 1 2 3 4 5 6 7 8 9 (3.5, 1.1, A)	1 3 1 2 1 2 3 4 5 6 7 8 9 (5.5, 1.9, I)	1 1 2 1 1 2 1 2 3 4 5 6 7 8 9 (4.5, 1.9, D)	1 3 1 1 1 1 1 2 3 4 5 6 7 8 9 (2.5, 1.5, I)	1 1 2 1 1 2 1 2 3 4 5 6 7 8 9 (5.5, 1.9, I)	1 2 1 1 1 2 1 2 3 4 5 6 7 8 9 (4.0, 2.1, D)	2 3 1 1 1 1 2 3 4 5 6 7 8 9 (2.0, 1.0, I)	2 1 2 1 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.8, D)	(307-315)
c. Ejection fraction <25%	1 1 2 1 1 2 1 2 3 4 5 6 7 8 9 (5.5, 1.6, I)	1 5 1 1 1 2 3 4 5 6 7 8 9 (3.0, 0.9, A)	1 2 2 1 2 1 2 3 4 5 6 7 8 9 (6.0, 2.0, I)	2 2 1 1 2 1 2 3 4 5 6 7 8 9 (4.5, 2.0, D)	1 2 3 1 1 1 2 3 4 5 6 7 8 9 (3.0, 1.2, I)	1 4 1 2 1 2 3 4 5 6 7 8 9 (5.0, 1.5, I)	2 1 1 2 1 1 1 2 3 4 5 6 7 8 9 (4.0, 2.0, I)	3 2 1 1 1 1 2 3 4 5 6 7 8 9 (2.0, 1.1, I)	2 1 2 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.6, D)	(316-324)
SINGLE VESSEL DISEASE - PROXIMAL LEFT ANTERIOR DESCENDING										
1. With a very positive exercise ECG										
a. Ejection fraction >50%	1 2 3 2 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	1 3 2 1 1 1 2 3 4 5 6 7 8 9 (5.5, 1.2, A)	1 1 2 4 1 2 3 4 5 6 7 8 9 (8.5, 0.9, A)	1 1 2 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.1, I)	2 2 1 1 2 1 2 3 4 5 6 7 8 9 (4.5, 1.6, D)	2 1 2 3 1 2 3 4 5 6 7 8 9 (8.0, 1.0, I)	1 1 2 3 1 1 2 3 4 5 6 7 8 9 (6.5, 1.4, A)	2 1 2 3 1 2 3 4 5 6 7 8 9 (3.0, 1.4, I)	1 2 1 3 1 2 3 4 5 6 7 8 9 (8.0, 1.0, I)	(325-333)
b. Ejection fraction 25-49%	1 2 2 3 1 2 3 4 5 6 7 8 9 (8.0, 0.9, A)	1 4 1 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.2, A)	1 1 3 3 1 2 3 4 5 6 7 8 9 (8.0, 0.9, A)	1 1 2 1 3 1 2 3 4 5 6 7 8 9 (7.5, 1.2, I)	2 2 1 1 1 1 1 2 3 4 5 6 7 8 9 (4.5, 1.8, D)	2 1 3 2 1 2 3 4 5 6 7 8 9 (8.0, 0.9, I)	2 1 1 2 1 1 1 2 3 4 5 6 7 8 9 (6.5, 1.5, I)	2 2 1 2 1 1 2 3 4 5 6 7 8 9 (2.5, 1.6, I)	2 1 1 3 1 2 3 4 5 6 7 8 9 (8.0, 1.1, I)	(334-342)
c. Ejection fraction <25%	1 1 1 1 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.6, I)	1 1 2 2 2 1 2 3 4 5 6 7 8 9 (4.5, 1.4, D)	1 1 3 3 1 2 3 4 5 6 7 8 9 (8.0, 1.1, I)	1 1 1 1 2 2 1 2 3 4 5 6 7 8 9 17.5, 1.9, I)	2 1 2 1 2 1 2 3 4 5 6 7 8 9 (4.0, 1.5, D)	1 1 4 2 1 2 3 4 5 6 7 8 9 (8.0, 0.9, I)	1 1 2 3 1 1 2 3 4 5 6 7 8 9 15.5, 2.1, D)	2 3 1 1 1 2 3 4 5 6 7 8 9 (2.0, 1.2, I)	1 2 2 2 1 2 3 4 5 6 7 8 9 (8.0, 1.0, I)	(343-351)
2. With a negative to minimally positive exercise ECG										
a. Ejection fraction >50%	2 1 3 2 1 2 3 4 5 6 7 8 9 (7.0, 0.9, I)	2 1 3 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.2, I)	1 2 2 1 2 1 2 3 4 5 6 7 8 9 (7.0, 1.1, I)	1 1 1 3 1 1 2 3 4 5 6 7 8 9 17.0, 1.0, I)	3 2 1 1 1 2 3 4 5 6 7 8 9 (4.0, 1.3, I)	1 2 1 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.3, I)	1 2 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.6, I)	3 1 2 1 1 2 3 4 5 6 7 8 9 (2.0, 1.0, I)	1 2 1 2 1 1 2 3 4 5 6 7 8 9 (6.0, 1.7, I)	(352-360)
b. Ejection fraction 25-49%	3 2 3 1 2 3 4 5 6 7 8 9 (7.0, 1.1, I)	2 1 2 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.4, I)	1 1 3 1 2 1 2 3 4 5 6 7 8 9 (7.0, 1.0, I)	1 2 2 2 1 2 3 4 5 6 7 8 9 (7.0, 1.3, I)	3 2 2 1 2 3 4 5 6 7 8 9 (4.0, 1.4, I)	1 1 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.1, I)	3 1 2 1 1 2 3 4 5 6 7 8 9 (4.0, 1.4, I)	3 2 1 1 1 2 3 4 5 6 7 8 9 (2.0, 1.0, I)	1 3 1 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.6, I)	(361-369)
c. Ejection fraction <25%	1 4 1 2 1 2 3 4 5 6 7 8 9 (5.0, 1.2, I)	2 1 2 1 1 1 1 2 3 4 5 6 7 8 9 (4.0, 1.4, I)	2 1 3 2 1 2 3 4 5 6 7 8 9 (7.0, 1.1, I)	2 1 1 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.7, D)	3 1 2 1 1 2 3 4 5 6 7 8 9 (3.0, 1.1, I)	1 1 3 1 1 1 2 3 4 5 6 7 8 9 (7.0, 1.1, I)	2 3 2 1 2 3 4 5 6 7 8 9 (3.0, 1.1, I)	3 3 1 1 2 3 4 5 6 7 8 9 12.0, 0.6, I)	1 1 2 1 1 1 1 2 3 4 5 6 7 8 9 15.0, 1.7, I)	(370-378)

apter 2

STABLE ANGINA

	NORMAL OR LOW RISK			MODERATELY HIGH RISK			VERY HIGH RISK			
	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	
SINGLE VESSEL DISEASE - ANY VESSEL OTHER THAN PLAD										
1. With a very positive exercise ECG										
a. Ejection fraction >50%	1 5 1 1 1 2 3 4 5 6 7 8 9 (7.0, 0.6, A)	1 3 2 2 1 2 3 4 5 6 7 8 9 12.5, 0.9, A)	2 4 2 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	2 4 1 1 1 3 4 1 2 3 4 5 6 7 8 9 (6.0, 0.9, I)	1 2 3 4 5 6 7 8 9 12.5, 0.6, A)	2 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.4, I)	1 2 2 1 1 1 5 3 1 2 3 4 5 6 7 8 9 (3.0, 1.8, I)	1 2 3 4 5 6 7 8 9 (1.0, 0.4, A)	1 1 3 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.1, I)	(379-387)
b. Ejection fraction 25-49%	3 1 2 1 1 1 2 3 4 5 6 7 8 9 16.5, 1.2, I)	1 3 2 2 1 2 3 4 5 6 7 8 9 (2.5, 0.9, A)	2 4 2 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	4 2 1 1 1 4 3 1 2 3 4 5 6 7 8 9 (5.5, 1.1, I)	1 2 3 4 5 6 7 8 9 (2.0, 0.5, A)	1 1 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.6, I)	1 3 1 1 1 5 3 1 2 3 4 5 6 7 8 9 (2.5, 2.0, D)	1 2 3 4 5 6 7 8 9 (1.0, 0.4, A)	1 1 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.4, I)	(388-396)
c. Ejection fraction <25%	3 1 1 1 1 1 2 3 2 1 1 2 3 4 5 6 7 8 9 15.5, 2.0, D)	1 2 2 3 1 2 3 4 5 6 7 8 9 (2.0, 0.8, A)	1 2 2 3 1 2 3 4 5 6 7 8 9 18.0, 1.0, A)	2 1 2 1 1 1 3 3 2 1 2 3 4 5 6 7 8 9 .0, 1.5, D)	1 2 3 4 5 6 7 8 9 (2.0, 0.6, A)	1 2 2 2 1 2 3 4 5 6 7 8 9 (8.0, 1.0, I)	2 3 1 1 1 6 2 1 2 3 4 5 6 7 8 9 (2.0, 1.5, I)	1 2 3 4 5 6 7 8 9 (1.0, 0.2, A)	1 2 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.5, I)	(397-405)
2. With a negative to minimally positive exercise ECG										
a. Ejection fraction >50%	1 2 1 1 1 1 1 2 3 4 5 6 7 8 9 (3.0, 2.1, D)	2 5 1 1 2 3 4 5 6 7 8 9 (2.0, 0.4, A)	1 1 3 1 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.5, D)	1 1 1 1 4 3 1 1 2 3 4 5 6 7 8 9 (2.0, 2.0, I)	1 2 3 4 5 6 7 8 9 (1.5, 0.6, A)	1 1 2 1 1 1 1 1 2 3 4 5 6 7 8 9 (4.5, 1.8, D)	4 1 1 1 6 2 1 2 3 4 5 6 7 8 9 (1.5, 1.6, I)	1 2 3 4 5 6 7 8 9 (1.0, 0.2, A)	2 1 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (4.5, 2.0, D)	(406-414)
b. Ejection fraction 25-49%	1 2 1 1 1 1 1 2 3 4 5 6 7 8 9 (3.0, 1.9, I)	2 6 1 2 3 4 5 6 7 8 9 (2.0, 0.2, A)	1 1 4 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.4, D)	3 1 1 1 1 4 4 1 2 3 4 5 6 7 8 9 (2.0, 1.7, I)	1 2 3 4 5 6 7 8 9 11.5, 0.5, A)	1 1 2 2 1 1 1 2 3 4 5 6 7 8 9 (4.5, 1.6, D)	4 2 1 1 6 2 1 2 3 4 5 6 7 8 9 (1.5, 1.2, A)	1 2 3 4 5 6 7 8 9 (1.0, 0.2, A)	2 1 1 2 1 1 1 2 3 4 5 6 7 8 9 (4.5, 1.8, I)	(415-423)
c. Ejection fraction <25%	1 3 1 1 1 1 2 3 4 5 6 7 8 9 12.0, 1.7, I)	2 6 1 2 3 4 5 6 7 8 9 (2.0, 0.2, A)	1 1 1 3 1 1 1 2 3 4 5 6 7 8 9 15.0, 1.4, I)	3 2 1 1 5 3 1 2 3 4 5 6 7 8 9 12.0, 1.6, I)	1 2 3 4 5 6 7 8 9 (1.0, 0.4, A)	1 1 3 1 1 1 1 2 3 4 5 6 7 8 9 14.0, 1.4, I)	5 1 1 1 6 2 1 2 3 4 5 6 7 8 5 (1.0, 1.0, A)	1 2 3 4 5 6 7 8 9 (1.0, 0.2, A)	2 1 2 1 1 1 1 2 3 4 5 6 7 8 9 (4.0, 1.6, I)	(424-432)

apter 3

UTE MYOCARDIAL INFARCTION

	NORMAL OR LOW RISK			MODERATELY HIGH RISK			VERY HIGH RISK			
	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	
RDIOGENIC SHOCK PRESENT										
1. Left main disease	1 2 2 3 1 2 3 4 5 6 7 8 9 (8.0, 1.0, A)	1 1 2 3 1 1 2 3 4 5 6 7 8 9 (7.5, 1.0, A)	1 1 1 1 2 1 2 3 4 5 6 7 8 9 (7.5, 1.8, I)	1 1 2 1 3 1 2 3 4 5 6 7 8 9 (7.5, 1.2, I)	2 3 1 2 1 2 3 4 5 6 7 8 9 (7.0, 1.1, I)	1 1 2 3 1 2 3 4 5 6 7 8 9 (8.0, 1.8, I)	2 2 2 2 1 2 3 4 5 6 7 8 9 (7.0, 2.2, D)	1 2 1 1 2 1 2 3 4 5 6 7 8 9 (6.0, 1.9, I)	1 1 1 1 1 3 1 2 3 4 5 6 7 8 9 (7.5, 1.9, I)	(1- 9)
2. Three vessel disease	1 2 2 3 1 2 3 4 5 6 7 8 9 (8.0, 1.0, A)	2 1 1 3 1 2 3 4 5 6 7 8 9 (6.5, 1.4, I)	1 1 3 3 1 2 3 4 5 6 7 8 9 (8.0, 0.9, A)	1 2 1 1 3 1 2 3 4 5 6 7 8 9 (7.5, 1.4, I)	1 3 2 1 1 1 2 3 4 5 6 7 8 9 (6.0, 1.6, I)	1 4 3 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	2 2 2 2 1 1 2 3 4 5 6 7 8 9 (6.5, 2.5, D)	2 2 1 2 1 2 3 4 5 6 7 8 9 (5.0, 1.4, I)	1 1 1 2 3 1 2 3 4 5 6 7 8 9 (8.0, 1.1, I)	(10- 18)
3. Two vessel disease	1 1 2 1 3 1 2 3 4 5 6 7 8 9 (7.5, 1.2, I)	2 2 2 1 2 3 4 5 6 7 8 9 (4.0, 1.4, I)	1 4 3 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	2 1 3 2 1 2 3 4 5 6 7 8 9 (7.0, 1.1, I)	2 3 1 1 2 3 4 5 6 7 8 9 (4.0, 1.1, I)	1 4 3 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	2 1 1 3 1 1 2 3 4 5 6 7 8 9 (5.5, 2.4, D)	1 5 1 1 1 2 3 4 5 6 7 8 9 (2.0, 0.6, A)	1 1 3 3 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	(19- 27)
4. Single vessel disease	1 2 1 1 3 1 2 3 4 5 6 7 8 9 (7.5, 1.4, I)	2 2 1 1 1 2 3 4 5 6 7 8 9 (3.0, 1.6, I)	5 3 1 2 3 4 5 6 7 8 9 (8.0, 0.4, A)	1 1 2 1 1 2 1 2 3 4 5 6 7 8 9 (6.5, 1.5, I)	2 2 2 1 1 2 3 4 5 6 7 8 9 (2.0, 1.0, I)	5 3 1 2 3 4 5 6 7 8 9 (8.0, 0.4, A)	3 1 1 1 1 1 2 3 4 5 6 7 8 9 (4.5, 2.1, D)	2 4 1 1 1 2 3 4 5 6 7 8 9 (2.0, 0.8, A)	1 4 3 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	(28- 36)
OLVING MYOCARDIAL INFARCTION (FIRST SIX URS) -- ASYMPTOMATIC										
Y ISCHEMIC ANATOMY, ANY EJECTION FRACTION	3 1 2 1 1 2 3 4 5 6 7 8 9 (2.5, 1.6, I)	4 1 3 1 2 3 4 5 6 7 8 9 (1.5, 0.9, A)	2 1 2 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.4, D)	4 1 2 1 2 3 4 5 6 7 8 9 (1.5, 1.4, A)	4 4 1 2 3 4 5 6 7 8 9 (1.5, 0.5, A)	1 1 1 2 1 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.5, D)	6 1 1 2 3 4 5 6 7 8 9 (1.0, 0.9, A)	7 1 1 2 3 4 5 6 7 8 9 (1.0, 0.1, A)	1 1 1 2 1 1 1 2 3 4 5 6 7 8 9 (4.0, 1.8, D)	(37- 45)
OLVING MYOCARDIAL INFARCTION (FIRST SIX URS) -- CONTINUING PAIN OR TOTAL OCCLUSION ANGIOGRAPHY; THOUT THROMBOLYSIS										
Left main disease										
a. Ejection fraction >50%	4 4 1 2 3 4 5 6 7 8 9 (8.5, 0.5, A)	2 3 3 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	3 1 3 1 2 3 4 5 6 7 8 9 (6.0, 1.9, I)	2 2 4 1 2 3 4 5 6 7 8 9 (8.5, 0.8, A)	1 3 2 2 1 2 3 4 5 6 7 8 9 (7.5, 0.9, A)	2 2 1 1 2 1 2 3 4 5 6 7 8 9 (6.0, 1.9, I)	2 1 3 2 1 2 3 4 5 6 7 8 9 (8.0, 1.1, I)	1 1 2 3 1 1 2 3 4 5 6 7 8 9 (6.5, 1.1, A)	1 3 2 2 1 2 3 4 5 6 7 8 9 (6.0, 1.6, I)	(46- 54)
b. Ejection fraction 25-49%	4 4 1 2 3 4 5 6 7 8 9 (8.5, 0.5, A)	2 3 3 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	3 1 3 1 2 3 4 5 6 7 8 9 (6.0, 1.9, I)	2 2 4 1 2 3 4 5 6 7 8 9 (8.5, 0.8, A)	1 3 2 2 1 2 3 4 5 6 7 8 9 (7.5, 0.9, A)	2 2 1 1 2 1 2 3 4 5 6 7 8 9 (6.0, 1.9, I)	2 1 3 2 1 2 3 4 5 6 7 8 9 (8.0, 1.1, I)	1 1 2 3 1 1 2 3 4 5 6 7 8 9 (6.5, 1.1, A)	1 3 2 2 1 2 3 4 5 6 7 8 9 (6.0, 1.6, I)	(55- 63)
c. Ejection fraction <25%	1 3 4 1 2 3 4 5 6 7 8 9 (8.5, 1.1, A)	3 1 3 1 2 3 4 5 6 7 8 9 (7.5, 1.5, A)	1 4 3 1 2 3 4 5 6 7 8 9 (5.0, 1.6, I)	1 2 2 3 1 2 3 4 5 6 7 8 9 (8.0, 1.2, A)	2 3 1 1 1 2 3 4 5 6 7 8 9 (7.0, 1.2, A)	2 3 1 2 1 2 3 4 5 6 7 8 9 (5.0, 1.6, I)	1 1 1 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.9, I)	1 1 1 1 4 1 2 3 4 5 6 7 8 9 (6.5, 1.6, D)	1 4 1 2 1 2 3 4 5 6 7 8 9 (5.0, 1.4, I)	(64- 72)
2. Three vessel disease										
a. Ejection fraction >50%	1 2 1 4 1 2 3 4 5 6 7 8 9 (8.5, 1.1, A)	1 1 2 1 3 1 2 3 4 5 6 7 8 9 (6.5, 2.5, D)	1 1 2 4 1 2 3 4 5 6 7 8 9 (8.5, 0.9, A)	1 1 3 3 1 2 3 4 5 6 7 8 9 (8.0, 0.9, A)	1 1 2 1 1 2 1 2 3 4 5 6 7 8 9 (5.5, 1.8, D)	2 1 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	1 1 1 4 1 1 2 3 4 5 6 7 8 9 (7.0, 1.1, A)	1 2 1 1 2 1 1 2 3 4 5 6 7 8 9 (3.5, 1.6, I)	1 1 2 3 1 1 2 3 4 5 6 7 8 9 (7.5, 1.1, A)	(73- 81)
b. Ejection fraction 25-49%	1 2 1 4 1 2 3 4 5 6 7 8 9 (8.5, 1.1, A)	1 1 2 1 3 1 2 3 4 5 6 7 8 9 (6.5, 2.5, D)	2 2 4 1 2 3 4 5 6 7 8 9 (8.5, 1.0, I)	1 1 3 3 1 2 3 4 5 6 7 8 9 (8.0, 0.9, A)	1 1 2 1 1 2 1 2 3 4 5 6 7 8 9 (5.5, 1.8, D)	2 1 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	1 1 1 4 1 1 2 3 4 5 6 7 8 9 (7.0, 1.1, A)	1 2 1 1 2 1 1 2 3 4 5 6 7 8 9 (3.5, 1.6, I)	1 1 2 3 1 1 2 3 4 5 6 7 8 9 (7.5, 1.1, A)	(82- 90)
c. Ejection fraction <25%	1 1 1 2 3 1 2 3 4 5 6 7 8 9 (8.0, 1.5, I)	1 1 2 1 1 1 1 2 3 4 5 6 7 8 9 (5.0, 2.2, D)	3 1 1 3 1 2 3 4 5 6 7 8 9 (7.0, 1.8, I)	1 1 2 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.5, I)	1 1 3 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.8, D)	2 3 2 1 1 2 3 4 5 6 7 8 9 (6.0, 1.1, I)	2 1 3 1 1 1 2 3 4 5 6 7 8 9 (6.0, 1.6, D)	1 2 2 2 1 1 1 2 3 4 5 6 7 8 9 (2.5, 1.5, I)	1 1 1 4 1 1 2 3 4 5 6 7 8 9 (7.0, 1.0, A)	(91- 99)

hapter 3

CUTE MYOCARDIAL INFARCTION

	NORMAL OR LOW RISK			MODERATELY HIGH RISK			VERY HIGH RISK			
	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	
3. Two vessel disease with proximal left anterior descending involvement										
a. Ejection fraction >50%	1 1 2 4 1 2 3 4 5 6 7 8 9 (8.5, 1.0, A)	1 1 2 3 1 1 2 3 4 5 6 7 8 9 (6.0, 2.1, D)	1 1 5 1 2 3 4 5 6 7 8 9 (9.0, 0.4, I)	1 1 5 1 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	1 1 3 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.8, D)	2 2 1 3 1 2 3 4 5 6 7 8 9 (7.5, 1.1, I)	1 2 1 1 1 2 1 2 3 4 5 6 7 8 9 (6.5, 1.8, I)	2 2 1 1 1 1 1 2 3 4 5 6 7 8 9 (2.5, 1.5, I)	1 1 1 4 1 1 2 3 4 5 6 7 8 9 (8.0, 1.0, A)	(100-108)
b. Ejection fraction 25-49%	1 1 2 4 1 2 3 4 5 6 7 8 9 (8.5, 1.0, A)	1 1 2 3 1 1 2 3 4 5 6 7 8 9 (6.0, 2.1, D)	1 1 5 1 2 3 4 5 6 7 8 9 (9.0, 0.6, I)	1 1 5 1 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	1 1 3 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.8, D)	1 1 2 1 3 1 2 3 4 5 6 7 8 9 (7.5, 1.2, I)	1 1 1 1 1 1 2 1 2 3 4 5 6 7 8 9 (6.5, 1.9, I)	2 2 1 1 2 1 2 3 4 5 6 7 8 9 (2.5, 1.4, I)	1 1 1 4 1 1 2 3 4 5 6 7 8 9 (8.0, 1.0, A)	(109-117)
c. Ejection fraction <25%	1 1 2 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.5, I)	2 1 1 2 1 1 1 2 3 4 5 6 7 8 9 (4.0, 2.4, D)	3 1 3 1 2 3 4 5 6 7 8 9 (7.0, 1.7, I)	1 1 3 2 1 2 2 1 1 1 1 1 2 3 4 5 6 7 8 9 (7.0, 1.4, I)	1 2 1 1 1 1 2 3 4 5 6 7 8 9 (2.5, 2.1, D)	1 1 2 1 3 1 2 3 4 5 6 7 8 9 (6.5, 1.6, I)	1 1 1 2 3 1 2 1 2 3 4 5 6 7 8 9 (5.5, 2.2, D)	1 1 1 3 1 1 1 2 3 4 5 6 7 8 9 (2.0, 1.1, I)		(118-126)
4. Two vessel disease without proximal left anterior descending involvement										
a. Ejection fraction >50%	3 2 1 1 1 2 3 4 5 6 7 8 9 (6.0, 1.1, I)	1 2 2 2 1 1 2 3 4 5 6 7 8 9 (4.0, 1.4, I)	1 1 2 2 1 2 3 4 5 6 7 8 9 (8.0, 0.8, I)	1 3 2 1 1 1 2 2 1 1 1 2 3 4 5 6 7 8 9 (5.5, 1.2, I)	3 1 3 1 1 2 3 4 5 6 7 8 9 (7.5, 1.0, A)		1 2 1 1 1 1 1 2 2 2 1 1 2 3 4 5 6 7 8 9 (4.5, 2.1, D)	1 1 1 3 1 1 1 2 3 4 5 6 7 8 9 (2.0, 0.9, I)	1 1 1 3 1 1 1 2 3 4 5 6 7 8 9 (7.0, 1.1, I)	(127-135)
b. Ejection fraction 25-49%	3 2 1 1 1 1 2 3 4 5 6 7 8 9 (6.0, 1.1, I)	1 2 2 2 1 1 2 3 4 5 6 7 8 9 (4.0, 1.4, I)	2 2 2 1 2 3 4 5 6 7 8 9 (8.0, 1.0, I)	2 2 2 1 1 1 2 2 1 1 1 2 3 4 5 6 7 8 9 (5.5, 1.4, I)	1 2 1 3 1 1 2 3 4 5 6 7 8 9 (7.5, 1.1, A)		1 2 1 1 1 1 1 2 2 2 1 1 2 3 4 5 6 7 8 9 (4.5, 2.1, D)	1 1 1 3 1 1 1 2 3 4 5 6 7 8 9 (2.0, 0.9, I)	1 1 1 3 1 1 1 2 3 4 5 6 7 8 9 (7.0, 1.1, I)	(136-144)
c. Ejection fraction <25%	1 1 2 2 1 1 3 1 1 2 1 1 2 3 4 5 6 7 8 9 (5.5, 1.5, I)	1 2 3 1 1 2 1 2 3 4 5 6 7 8 9 (2.5, 1.5, I)	2 1 1 2 1 2 3 4 5 6 7 8 9 (7.0, 1.7, I)	1 2 1 2 1 1 3 1 2 1 1 1 2 3 4 5 6 7 8 9 (5.5, 1.5, I)	1 3 1 1 1 1 2 3 4 5 6 7 8 9 (2.5, 1.6, I)		1 2 2 2 1 3 3 1 1 2 3 4 5 6 7 8 9 (3.0, 1.8, I)	1 2 2 2 1 1 2 3 4 5 6 7 8 9 (2.0, 0.7, I)	1 2 2 2 1 1 2 3 4 5 6 7 8 9 (6.0, 1.2, A)	(145-153)
5. Single vessel disease - proximal left anterior descending										
a. Ejection fraction >50%	1 2 1 4 1 2 3 4 5 6 7 8 9 (8.5, 1.0, A)	1 2 2 1 2 1 2 3 4 5 6 7 8 9 (4.0, 1.8, D)	3 4 1 2 3 4 5 6 7 8 9 (9.0, 0.4, I)	2 1 2 2 1 2 1 1 1 1 1 2 3 4 5 6 7 8 9 (8.0, 1.0, I)	2 2 3 1 2 3 4 5 6 7 8 9 (8.0, 0.7, I)		1 3 2 1 3 3 1 1 2 3 4 5 6 7 8 9 (5.0, 1.1, I)	1 5 1 1 2 3 4 5 6 7 8 9 (3.0, 1.0, I)	1 5 1 1 2 3 4 5 6 7 8 9 (8.0, 0.4, I)	(154-162)
b. Ejection fraction 25-49%	1 2 1 4 1 2 3 4 5 6 7 8 9 (8.5, 1.0, A)	1 2 2 1 2 1 2 3 4 5 6 7 8 9 (4.0, 1.8, D)	3 4 1 2 3 4 5 6 7 8 9 (9.0, 0.4, I)	2 1 2 2 1 2 1 1 1 1 1 2 3 4 5 6 7 8 9 (8.0, 1.0, I)	2 2 3 1 2 3 4 5 6 7 8 9 (8.0, 0.7, I)		1 4 1 1 3 3 1 1 2 3 4 5 6 7 8 9 (5.0, 1.0, I)	1 5 1 1 2 3 4 5 6 7 8 9 (3.0, 1.0, I)	1 5 1 1 2 3 4 5 6 7 8 9 (8.0, 0.4, I)	(163-171)
c. Ejection fraction <25%	1 2 1 1 3 1 2 3 4 5 6 7 8 9 (7.5, 1.6, I)	2 2 1 1 2 1 2 1 4 5 6 7 8 9 (2.5, 1.9, D)	3 4 1 2 3 4 5 6 7 8 9 (9.0, 0.4, I)	2 1 2 2 3 1 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.9, D)	2 2 3 1 2 3 4 5 6 7 8 9 (8.0, 0.7, I)		1 1 1 1 1 1 4 1 1 1 1 2 3 4 5 6 7 8 9 (4.0, 2.0, I)	1 5 1 1 2 3 4 5 6 7 8 9 (8.0, 0.4, I)		(172-180)
6. Single vessel disease - any vessel other than PLAD										
a. Ejection fraction >50%	1 1 2 1 2 1 2 2 2 2 1 2 3 4 5 6 7 8 9 (5.5, 2.4, D)	1 2 3 4 5 6 7 8 9 (2.5, 1.0, I)	1 1 3 2 1 2 3 4 5 6 7 8 9 (8.0, 0.7, I)	1 2 1 1 1 1 3 3 1 1 1 2 3 4 5 6 7 8 9 (4.5, 2.5, O)	1 1 1 3 1 1 2 3 4 5 6 7 8 9 (2.0, 0.8, A)		2 1 2 1 1 4 4 1 2 3 4 5 6 7 8 9 (3.0, 1.9, I)	1 2 3 4 5 6 7 8 9 (1.5, 0.5, A)	1 1 2 3 1 1 2 3 4 5 6 7 8 9 (7.0, 1.5, I)	(181-189)
b. Ejection fraction 25-49%	1 1 2 1 2 1 2 2 2 2 1 2 3 4 5 6 7 8 9 (5.5, 2.4, D)	1 2 3 4 5 6 7 8 9 (2.5, 1.0, I)	1 1 3 2 1 2 3 4 5 6 7 8 9 (8.0, 0.7, I)	1 2 1 1 1 1 3 3 1 1 1 2 3 4 5 6 7 8 9 (4.5, 2.5, O)	1 1 1 3 1 1 2 3 4 5 6 7 8 9 (2.0, 0.8, A)		2 1 3 1 1 4 4 1 2 3 4 5 6 7 8 9 (3.0, 1.5, I)	1 2 3 4 5 6 7 8 9 (1.5, 0.5, A)	1 1 2 3 1 1 2 3 4 5 6 7 8 9 (7.0, 1.5, I)	(190-198)
c. Ejection fraction <25%	1 2 2 1 1 1 3 2 2 1 1 2 3 4 5 6 7 8 9 (4.0, 2.0, D)	1 2 3 4 5 6 7 8 9 (2.0, 0.9, A)	1 1 1 2 2 1 2 3 4 5 6 7 8 9 (8.0, 1.1, I)	2 1 1 1 1 1 1 4 4 1 2 3 4 5 6 7 8 9 (3.5, 2.1, I)	2 1 1 2 1 1 2 3 4 5 6 7 8 9 (1.5, 0.5, A)		3 1 3 1 4 4 1 2 3 4 5 6 7 8 9 (2.5, 1.6, A)	1 2 3 4 5 6 7 8 9 (1.5, 0.5, A)	2 1 2 2 1 1 2 3 4 5 6 7 8 9 (6.0, 1.5, I)	(199-207)

. INFARCTION	NORMAL OR LOW RISK			MODERATELY HIGH RISK			VERY HIGH RISK			
	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	
)LVING MYOCARDIAL INFARCTION (FIRST SIX /RS) -- CONTINUING PAIN OR TOTAL OCCLUSION ANGIOGRAPHY; TH THROMBOLYSIS										
left main disease										
a. Ejection fraction >50%	2 3 3 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	2 1 3 2 1 2 3 4 5 6 7 8 9 (8.0, 0.9, I)	3 1 3 1 2 3 4 5 6 7 8 9 (7.0, 1.7, I)	2 1 2 3 1 2 3 4 5 6 7 8 9 (8.0, 1.0, I)	2 2 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.2, II)	1 2 1 1 2 1 2 3 4 5 6 7 8 9 (7.0, 1.7, I)	1 1 1 1 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.5, I)	1 2 1 3 1 1 2 3 4 5 6 7 8 9 (6.5, 1.4, A)	1 2 2 2 1 2 3 4 5 6 7 8 9 (7.0, 1.6, I)	(208-216)
b. Ejection fraction 25-49%	2 3 3 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	2 1 3 2 1 2 3 4 5 6 7 8 9 (8.0, 0.9, I)	3 1 3 1 2 3 4 5 6 7 8 9 (7.0, 1.7, II)	2 1 2 3 1 2 3 4 5 6 7 8 9 (8.0, 1.0, I)	2 2 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.2, II)	1 2 1 1 2 1 2 3 4 5 6 7 8 9 (7.0, 1.7, I)	1 1 1 1 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.5, I)	1 2 1 3 1 1 2 3 4 5 6 7 8 9 (6.5, 1.4, A)	1 2 2 2 1 2 3 4 5 6 7 8 9 (7.0, 1.6, I)	(217-225)
c. Ejection fraction <25%	1 2 2 3 1 2 3 4 5 6 7 8 9 (8.0, 1.2, A)	1 2 2 1 2 1 2 3 4 5 6 7 8 9 (7.0, 1.5, I)	4 3 1 2 3 4 5 6 7 8 9 (5.0, 1.7, I)	1 2 1 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.5, II)	1 2 1 2 1 1 1 2 3 4 5 6 7 8 9 (6.5, 1.6, I)	1 3 1 2 1 2 3 4 5 6 7 8 9 (5.0, 1.7, I)	1 1 2 1 1 2 1 2 3 4 5 6 7 8 9 (6.5, 2.0, I)	1 1 2 4 1 2 3 4 5 6 7 8 9 (6.0, 1.9, DI	1 3 1 2 1 2 3 4 5 6 7 8 9 (5.0, 1.6, I)	(226-234)
2. Three vessel disease										
a. Ejection fraction >50%	1 1 3 3 1 2 3 4 5 6 7 8 9 (7.0, 1.1, I)	1 1 2 2 2 1 2 3 4 5 6 7 8 9 (5.5, 2.0, DI	1 2 4 1 2 3 4 5 6 7 8 9 (9.0, 0.6, I)	1 1 2 2 2 1 1 2 3 4 5 6 7 8 9 (7.5, 1.1, I)	1 1 3 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.4, I)	1 1 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.6, I)	1 2 1 2 1 1 1 2 3 4 5 6 7 8 9 (6.0, 1.9, II	1 2 2 1 1 1 1 2 3 4 5 6 7 8 9 (3.0, 1.2, I)	1 1 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.9, I)	(235-243)
b. Ejection fraction 25-49%	1 1 3 3 1 2 3 4 5 6 7 8 9 (7.0, 1.1, II	1 1 2 2 2 1 2 3 4 5 6 7 8 9 (5.5, 2.0, D)	1 2 4 1 2 3 4 5 6 7 8 9 (9.0, 0.7, I)	1 1 2 2 2 1 1 2 3 4 5 6 7 8 9 (7.5, 1.1, I)	1 1 3 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.4, II	1 1 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.6, I)	2 2 2 1 1 1 2 3 4 5 6 7 8 9 (5.5, 2.1, DI	1 2 2 1 1 1 1 2 3 4 5 6 7 8 9 (3.0, 1.2, I)	1 1 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.9, I)	(244-252)
c. Ejection fraction <25%	1 1 1 2 1 2 1 2 3 4 5 6 7 8 9 (7.0, 1.5, II	2 1 2 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.8, I)	3 1 3 1 2 3 4 5 6 7 8 9 (8.0, 1.7, I)	1 2 1 2 1 1 1 2 3 4 5 6 7 8 9 (6.5, 1.5, I)	2 1 1 4 1 1 2 3 4 5 6 7 8 9 (4.0, 1.8, I)	1 2 1 2 1 1 2 3 4 5 6 7 8 9 (6.0, 1.7, I)	2 1 2 1 1 2 1 2 3 4 5 6 7 8 9 (4.0, 1.7, I)	2 2 3 1 1 2 3 4 5 6 7 8 9 (2.5, 1.1, A)	1 1 3 1 1 1 2 3 4 5 6 7 8 9 (7.0, 1.1, II	(253-261)
3. Two vessel disease with proximal left anterior descending involvement										
a. Ejection fraction >50%	1 1 2 1 3 1 2 3 4 5 6 7 8 9 (7.5, 1.2, II	1 1 1 3 2 1 2 3 4 5 6 7 8 9 (5.0, 1.5, DI	1 1 4 1 2 3 4 5 6 7 8 9 (9.0, 0.5, II	2 2 3 1 1 1 1 2 3 4 5 6 7 8 9 (7.5, 1.1, II)	5 1 1 2 3 4 5 6 7 8 9 (5.0, 1.1, I)	1 1 2 2 1 2 3 4 5 6 7 8 9 (8.0, 0.8, I)	1 1 2 1 1 2 1 2 3 4 5 6 7 8 9 (5.5, 1.8, I)	2 2 2 1 1 1 2 3 4 5 6 7 8 9 (2.5, 1.1, I)	1 5 1 1 2 3 4 5 6 7 8 9 (8.0, 0.7, I)	(262-2701
b. Ejection fraction 25-49%	1 1 2 1 3 1 2 3 4 5 6 7 8 9 (7.5, 1.2, I)	1 1 1 3 2 1 2 3 4 5 6 7 8 9 (5.0, 1.5, DI	1 1 4 1 2 3 4 5 6 7 8 9 (9.0, 0.7, II	2 2 3 1 1 1 1 2 3 4 5 6 7 8 9 (7.5, 1.1, I)	5 1 1 2 3 4 5 6 7 8 9 (5.0, 1.1, II	1 1 2 2 1 2 3 4 5 6 7 8 9 (8.0, 1.0, I)	1 2 1 1 1 2 1 2 3 4 5 6 7 8 9 (5.5, 1.9, II	2 2 2 1 1 1 2 3 4 5 6 7 8 9 (2.5, 1.1, I)	1 5 1 1 2 3 4 5 6 7 8 9 (8.0, 0.7, I)	(271-279)
c. Ejection fraction <25%	1 1 1 3 1 1 1 2 3 4 5 6 7 8 9 (7.0, 1.2, I)	2 1 1 1 3 1 2 3 4 5 6 7 8 9 (3.5, 1.5, I)	3 1 2 1 2 3 4 5 6 7 8 9 (6.0, 1.7, I)	1 1 1 4 1 1 2 3 4 5 6 7 8 9 (7.0, 1.4, II	2 2 1 3 1 2 3 4 5 6 7 8 9 (2.5, 1.5, I)	1 1 1 1 2 1 2 3 4 5 6 7 8 9 (7.0, 1.8, I)	2 1 1 1 2 1 1 2 3 4 5 6 7 8 9 (4.5, 2.2, I)	2 3 2 1 1 2 3 4 5 6 7 8 9 (2.0, 0.9, A)	1 1 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.3, I)	(280-288)
4. Two vessel disease without proximal left anterior descending involvement										
a. Ejection fraction >50%	1 3 1 1 1 1 1 2 3 4 5 6 7 8 9 (5.5, 1.6, I)	2 2 1 3 1 2 3 4 5 6 7 8 9 (3.0, 1.6, I)	1 1 2 1 1 2 3 4 5 6 7 8 9 (8.0, 0.8, I)	1 4 1 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.5, I)	2 1 1 2 1 1 1 2 3 4 5 6 7 8 9 (3.5, 1.5, II	2 1 2 1 1 2 3 4 5 6 7 8 9 (7.5, 1.0, I)	1 1 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (4.5, 2.1, D)	1 2 2 2 1 1 2 3 4 5 6 7 8 9 (2.0, 0.9, I)	1 2 1 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.6, I)	(289-297)
b. Ejection fraction 25-49%	1 3 1 1 1 1 1 2 3 4 5 6 7 8 9 (5.5, 1.6, I)	2 2 1 3 1 2 3 4 5 6 7 8 9 (3.0, 1.6, I)	2 2 1 1 2 3 4 5 6 7 8 9 (8.0, 1.0, I)	1 1 3 1 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.6, I)	2 1 1 2 1 1 1 2 3 4 5 6 7 8 9 (3.5, 1.5, I)	1 1 1 2 1 1 2 3 4 5 6 7 8 9 (7.5, 1.2, II	1 1 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (4.5, 2.1, 0)	1 2 2 2 1 1 2 3 4 5 6 7 8 9 (2.0, 0.9, II	1 2 1 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.6, II	(298-3061
c. Ejection fraction <25%	2 1 2 1 1 1 4 1 1 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.8, D)	2 1 1 1 1 1 2 3 4 5 6 7 8 9 (1.5, 1.2, I)	2 1 1 1 1 2 3 4 5 6 7 8 9 (6.0, 1.4, I)	1 1 1 2 1 1 1 4 1 1 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.8, DI	1 1 1 2 3 4 5 6 7 8 9 (1.5, 1.5, II	1 2 1 1 1 2 3 4 5 6 7 8 9 (6.0, 1.4, I)	3 2 2 1 3 3 1 1 2 3 4 5 6 7 8 9 (2.0, 2.0, I)	1 2 3 4 5 6 7 8 9 (2.0, 0.7, I)	1 1 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (6.0, 2.0, 0)	(307-315)

apter 3

UTE MYOCARDIAL INFARCTION

	NORMAL OR LOW RISK			MODERATELY HIGH RISK			VERY HIGH RISK			
	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	
5. Single vessel disease - proximal left anterior descending										
a. Ejection fraction >50%	2 2 1 3 1 2 3 4 5 6 7 8 9 (7.5, 1.1, I)	2 1 2 1 2 1 2 3 4 5 6 7 8 9 (4.0, 1.9, D)	3 3 1 2 3 4 5 6 7 8 9 (8.5, 0.5, I)	1 2 1 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.4, I)	2 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (3.0, 1.6, I)	1 1 2 2 1 2 3 4 5 6 7 8 9 (8.0, 1.2, I)	1 1 2 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.6, I)	3 1 3 1 2 3 4 5 6 7 8 9 (2.0, 0.9, I)	1 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.5, I)	(316-324)
b. Ejection fraction 25-49%	2 2 1 3 1 2 3 4 5 6 7 8 9 (7.5, 1.1, I)	2 1 2 1 2 1 2 3 4 5 6 7 8 9 (4.0, 1.9, D)	3 3 1 2 3 4 5 6 7 8 9 (8.5, 0.5, I)	2 1 2 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (7.0, 1.4, I)	2 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (3.0, 1.6, I)	1 1 2 2 1 2 3 4 5 6 7 8 9 (8.0, 1.2, I)	1 1 3 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.4, I)	3 1 3 1 2 3 4 5 6 7 8 9 (2.0, 0.9, I)	1 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.5, I)	(325-333)
c. Ejection fraction <25%	3 1 1 2 1 2 3 4 5 6 7 8 9 (6.5, 1.5, I)	3 1 1 1 2 1 2 3 4 5 6 7 8 9 (2.5, 2.0, D)	3 3 1 2 3 4 5 6 7 8 9 (8.5, 0.5, I)	2 2 1 4 2 1 1 2 3 4 5 6 7 8 9 (6.0, 1.9, D)	1 2 3 4 5 6 7 8 9 (1.0, 1.3, I)	1 1 2 2 1 2 3 4 5 6 7 8 9 (8.0, 1.3, I)	1 2 1 1 1 1 4 2 1 1 2 3 4 5 6 7 8 9 (4.0, 2.1, I)	1 2 3 4 5 6 7 8 9 (1.0, 0.6, I)	1 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.5, I)	(334-342)
6. Single vessel disease - any vessel other than PLAD										
a. Ejection fraction >50%	1 1 3 2 1 1 2 3 4 5 6 7 8 9 (4.0, 2.1, D)	2 2 2 2 1 2 3 4 5 6 7 8 9 (2.5, 1.0, I)	1 3 2 1 2 3 4 5 6 7 8 9 (8.0, 0.7, I)	1 3 1 1 1 1 3 3 1 1 1 2 3 4 5 6 7 8 9 (3.0, 2.6, D)	1 2 3 4 5 6 7 8 9 (2.0, 0.8, A)	1 1 3 1 1 2 3 4 5 6 7 8 9 (8.0, 1.0, I)	3 1 1 1 1 1 4 4 1 2 3 4 5 6 7 8 9 (2.5, 2.1, I)	1 2 3 4 5 6 7 8 9 (1.5, 0.5, A)	1 1 1 3 1 1 2 3 4 5 6 7 8 9 (8.0, 1.4, I)	(343-351)
b. Ejection fraction 25-49%	1 1 3 2 1 1 2 3 4 5 6 7 8 9 (4.0, 2.1, D)	2 2 2 2 1 2 3 4 5 6 7 8 9 (2.5, 1.0, I)	1 3 2 1 2 3 4 5 6 7 8 9 (8.0, 0.7, I)	1 3 1 1 1 1 3 3 1 1 1 2 3 4 5 6 7 8 9 (3.0, 2.6, D)	1 2 3 4 5 6 7 8 9 (2.0, 0.8, A)	1 1 3 1 1 2 3 4 5 6 7 8 9 (8.0, 1.0, I)	3 1 2 1 1 4 4 1 2 3 4 5 6 7 8 9 (2.5, 1.8, I)	1 2 3 4 5 6 7 8 9 (1.5, 0.5, A)	1 1 1 3 1 1 2 3 4 5 6 7 8 9 (8.0, 1.4, I)	(352-360)
c. Ejection fraction <25%	1 2 3 1 1 1 2 3 4 5 6 7 8 9 (4.0, 1.8, D)	3 2 2 1 1 2 3 4 5 6 7 8 9 (2.0, 0.9, A)	1 1 2 2 1 2 3 4 5 6 7 8 9 (8.0, 1.2, I)	2 2 1 1 1 4 4 1 2 3 4 5 6 7 8 9 (2.5, 2.0, I)	1 2 3 4 5 6 7 8 9 (1.5, 0.5, A)	2 1 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.5, I)	4 1 2 1 4 4 1 2 3 4 5 6 7 8 9 (1.5, 1.6, A)	1 2 3 4 5 6 7 8 9 (1.5, 0.5, A)	1 2 1 2 1 1 2 3 4 5 6 7 8 9 (6.0, 1.6, I)	(361-369)

[illegible] 1 = inappropriate, 5 = equivocal, 9 = extremely appropriate

apter 4

ST MYOCARDIAL INFARCTION

	NORMAL OR LOW RISK			MODERATELY HIGH RISK			VERY HIGH RISK			
	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	
THIN 21 DAYS OF AMI; PATIENT HAS NTINUING PAIN										
LEFT MAIN DISEASE										
1. Ejection fraction >50%	1 7 1 2 3 4 5 6 7 8 9 (9.0, 0.2, A)	1 7 1 2 3 4 5 6 7 8 9 (9.0, 0.2, A)	1 7 1 2 3 4 5 6 7 8 9 (5.0, 0.2, A)	1 7 1 2 3 4 5 6 7 8 9 (9.0, 0.2, A)	1 7 1 2 3 4 5 6 7 8 9 (9.0, 0.2, A)	1 7 1 2 3 4 5 6 7 8 9 (5.0, 0.2, A)	1 1 2 1 3 1 2 3 4 5 6 7 8 9 (7.5, 1.4, I)	1 1 2 1 3 1 2 3 4 5 6 7 8 9 (7.5, 1.2, I)	7 1 1 2 3 4 5 6 7 8 9 (5.0, 0.1, A)	(1- 9)
2. Ejection fraction 25-49%	7 1 2 3 4 5 6 7 8 9 (9.0, 0.0, I)	1 7 1 2 3 4 5 6 7 8 9 (9.0, 0.4, A)	1 7 1 2 3 4 5 6 7 8 9 (5.0, 0.2, A)	1 7 1 2 3 4 5 6 7 8 9 (9.0, 0.4, A)	1 7 1 2 3 4 5 6 7 8 9 (9.0, 0.4, A)	1 7 1 2 3 4 5 6 7 8 9 (5.0, 0.2, A)	1 1 1 1 3 1 2 3 4 5 6 7 8 9 (8.0, 1.6, I)	1 1 1 1 3 1 2 3 4 5 6 7 8 9 (8.5, 1.0, I)	6 1 1 2 3 4 5 6 7 8 9 (5.0, 0.1, I)	(10- 18)
3. Ejection fraction <25%	2 6 1 2 3 4 5 6 7 8 9 (9.0, 1.0, I)	2 6 1 2 3 4 5 6 7 8 9 (9.0, 1.0, I)	1 7 1 2 3 4 5 6 7 8 9 (5.0, 0.2, A)	2 1 5 1 2 3 4 5 6 7 8 9 (9.0, 1.1, I)	2 1 5 1 2 3 4 5 6 7 8 9 (9.0, 1.1, I)	1 7 1 2 3 4 5 6 7 8 9 (5.0, 0.2, A)	1 1 2 1 3 1 2 3 4 5 6 7 8 9 (6.5, 1.9, I)	1 1 2 1 3 1 2 3 4 5 6 7 8 9 (6.5, 1.8, I)	7 1 1 2 3 4 5 6 7 8 9 (5.0, 0.1, A)	(19- 27)
THREE VESSEL DISEASE										
1. Ejection fraction >50%	1 2 5 1 2 3 4 5 6 7 8 9 (9.0, 0.5, A)	1 1 3 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.1, A)	2 3 3 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	1 3 4 1 2 3 4 5 6 7 8 9 (8.5, 0.9, A)	1 2 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.2, A)	4 2 2 1 2 3 4 5 6 7 8 9 (7.5, 0.8, A)	1 4 2 1 1 2 3 4 5 6 7 8 9 (7.0, 0.9, A)	1 2 2 1 1 1 1 2 3 4 5 6 7 8 9 (4.0, 1.8, D)	4 3 1 1 2 3 4 5 6 7 8 9 (7.5, 0.6, A)	(28- 36)
2. Ejection fraction 25-49%	1 2 5 1 2 3 4 5 6 7 8 9 (9.0, 0.5, A)	1 1 2 3 1 1 2 3 4 5 6 7 8 9 (7.5, 1.4, A)	2 3 3 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	1 3 4 1 2 3 4 5 6 7 8 9 (8.5, 0.9, A)	1 2 2 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.2, A)	4 2 2 1 2 3 4 5 6 7 8 9 (7.5, 0.8, A)	1 1 3 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.0, A)	2 1 2 1 1 1 1 2 3 4 5 6 7 8 9 (4.0, 1.9, D)	1 3 3 1 1 2 3 4 5 6 7 8 9 (7.5, 0.8, A)	(37- 45)
3. Ejection fraction <25%	1 1 2 4 1 2 3 4 5 6 7 8 9 (8.5, 1.1, I)	1 1 2 1 1 2 1 2 3 4 5 6 7 8 9 (6.5, 2.0, D)	1 1 1 3 2 1 2 3 4 5 6 7 8 9 (8.0, 1.0, I)	2 1 1 4 1 2 3 4 5 6 7 8 9 (8.5, 1.4, I)	1 1 3 2 1 1 2 3 4 5 6 7 8 9 (6.0, 1.8, D)	2 2 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.0, I)	2 1 1 1 2 1 1 2 3 4 5 6 7 8 9 (6.5, 1.9, D)	1 1 2 1 1 1 1 2 3 4 5 6 7 8 9 (3.5, 2.1, D)	1 5 1 1 1 2 3 4 5 6 7 8 9 (7.0, 0.5, A)	(46- 54)
TWO VESSEL DISEASE WITH PROXIMAL LEFT ANTERIOR DESCENDING INVOLVEMENT										
1. Ejection fraction >50%	1 2 5 1 2 3 4 5 6 7 8 9 (9.0, 0.5, A)	1 1 1 4 1 1 2 3 4 5 6 7 8 9 (7.0, 1.4, D)	1 1 6 1 2 3 4 5 6 7 8 9 (9.0, 0.4, A)	1 4 3 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	1 1 2 3 1 1 2 3 4 5 6 7 8 9 (6.5, 1.5, D)	3 5 1 2 3 4 5 6 7 8 9 (9.0, 0.8, A)	5 2 1 2 3 4 5 6 7 8 9 (7.0, 0.6, I)	2 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (4.0, 1.6, I)	2 2 3 1 2 3 4 5 6 7 8 9 (8.0, 0.7, I)	(55- 63)
2. Ejection fraction 25-49%	1 2 5 1 2 3 4 5 6 7 8 9 (9.0, 0.5, A)	2 4 2 1 2 3 4 5 6 7 8 9 (7.0, 1.5, D)	1 2 5 1 2 3 4 5 6 7 8 9 (9.0, 0.5, A)	1 4 3 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	1 1 1 3 2 1 2 3 4 5 6 7 8 9 (7.0, 1.5, D)	3 1 4 1 2 3 4 5 6 7 8 9 (8.5, 0.9, A)	1 4 2 1 2 3 4 5 6 7 8 9 (7.0, 0.7, I)	2 1 1 2 1 1 2 3 4 5 6 7 8 9 (4.0, 1.7, I)	2 3 2 1 2 3 4 5 6 7 8 9 (8.0, 0.6, I)	(64- 72)
3. Ejection fraction <25%	1 1 3 3 1 2 3 4 5 6 7 8 9 (8.0, 1.0, I)	3 1 3 1 1 2 3 4 5 6 7 8 9 (6.5, 2.1, D)	1 2 1 4 1 2 3 4 5 6 7 8 9 (8.5, 1.0, A)	2 2 1 3 1 2 3 4 5 6 7 8 9 (7.5, 1.4, I)	3 1 3 1 1 2 3 4 5 6 7 8 9 (6.0, 2.2, D)	1 3 4 1 2 3 4 5 6 7 8 9 (8.0, 1.1, A)	1 1 2 1 2 1 3 2 1 1 2 3 4 5 6 7 8 9 (6.0, 1.6, I)	1 2 3 2 1 1 2 3 4 5 6 7 8 9 (2.0, 2.0, I)	5 2 1 2 3 4 5 6 7 8 9 (7.0, 0.6, I)	(73- 81)
TWO VESSEL DISEASE WITHOUT PROXIMAL LEFT ANTERIOR DESCENDING INVOLVEMENT										
1. Ejection fraction >50%	3 2 3 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	1 1 1 2 3 1 2 3 4 5 6 7 8 9 (5.0, 1.1, I)	2 4 2 1 2 3 4 5 6 7 8 5 (8.0, 0.5, A)	1 1 1 3 2 1 2 3 4 5 6 7 8 9 (8.0, 1.0, I)	1 1 1 3 2 1 2 3 4 5 6 7 8 9 (5.0, 1.0, I)	4 2 2 1 2 3 4 5 6 7 8 9 (7.5, 0.8, A)	1 1 2 2 2 1 2 3 4 5 6 7 8 9 (6.0, 1.6, I)	2 1 2 1 1 1 1 2 3 4 5 6 7 8 9 (3.0, 1.4, I)	1 3 2 2 1 2 3 4 5 6 7 8 9 (7.5, 0.9, A)	(82- 90)
2. Ejection fraction 25-49%	3 2 3 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	2 1 2 1 2 1 2 3 4 5 6 7 8 9 (5.0, 1.6, D)	3 3 2 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	1 1 1 3 2 1 2 3 4 5 6 7 8 9 (8.0, 1.0, I)	1 2 3 2 1 2 3 4 5 6 7 8 9 (5.0, 1.4, D)	5 1 2 1 2 3 4 5 6 7 8 9 (7.0, 0.6, A)	1 3 1 3 1 2 3 4 5 6 7 8 9 (6.0, 1.6, I)	2 1 3 2 1 2 3 4 5 6 7 8 9 (3.0, 1.4, I)	1 4 1 2 1 2 3 4 5 6 7 8 9 (7.0, 0.8, A)	(91- 99)
3. Ejection fraction <25%	1 1 1 4 1 1 2 3 4 5 6 7 8 9 (8.0, 1.1, A)	1 3 1 1 2 1 2 3 4 5 6 7 8 9 (3.5, 2.2, D)	1 3 2 2 1 2 3 4 5 6 7 8 9 (7.5, 0.9, A)	1 1 2 3 1 1 2 3 4 5 6 7 8 9 (7.5, 1.4, I)	1 3 1 1 2 1 2 3 4 5 6 7 8 9 (3.5, 2.2, D)	1 3 2 2 1 2 3 4 5 6 7 8 9 (7.5, 0.9, A)	1 3 1 1 2 1 2 3 4 5 6 7 8 9 (5.5, 1.5, I)	2 3 1 2 1 2 3 4 5 6 7 8 9 (2.0, 1.5, I)	5 1 2 1 2 3 4 5 6 7 8 9 (7.0, 0.6, A)	(100-108)

propriateness scale: 1 = extremely inappropriate, 5 = equivocal, 9 = extremely appropriate

pter 4

T MYOCARDIAL INFARCTION

	NORMAL OR LOW RISK			MODERATELY HIGH RISK			VERY HIGH RISK			
	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	
SINGLE VESSEL DISEASE - PROXIMAL LEFT ANTERIOR DESCENDING										
1. Ejection fraction >50%	1 4 2 1 2 3 4 5 6 7 8 9 (8.0, 0.4, I)	1 1 3 1 2 1 2 3 4 5 6 7 8 9 (5.0, 1.2, D)	1 2 5 1 2 3 4 5 6 7 8 9 (9.0, 0.5, A)	1 2 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	1 1 3 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.1, I)	2 2 4 1 2 3 4 5 6 7 8 9 (8.5, 0.8, A)	4 1 1 1 1 1 2 3 4 5 6 7 8 9 (5.5, 1.2, I)	1 1 3 2 1 1 2 3 4 5 6 7 8 9 (3.0, 0.9, A)	3 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	(109-117)
2. Ejection fraction 25-49%	2 3 3 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	1 1 2 2 1 1 1 2 3 4 5 6 7 8 9 (5.5, 1.5, D)	1 2 5 1 2 3 4 5 6 7 8 9 (9.0, 0.5, A)	1 2 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	1 1 1 2 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.2, I)	2 2 4 1 2 3 4 5 6 7 8 9 (8.5, 0.8, A)	1 3 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (5.5, 1.4, I)	1 1 3 3 1 2 3 4 5 6 7 8 9 (3.0, 1.1, I)	3 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	(118-126)
3. Ejection fraction <25%	1 1 1 3 2 1 2 3 4 5 6 7 8 9 (8.0, 1.0, I)	2 1 3 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.6, I)	1 3 4 1 2 3 4 5 6 7 8 9 (8.5, 0.6, A)	2 3 2 1 1 2 3 4 5 6 7 8 9 (7.0, 1.0, I)	1 2 1 1 1 2 3 4 5 6 7 8 9 (4.5, 1.6, I)	2 2 4 1 2 3 4 5 6 7 8 9 (8.5, 0.8, A)	1 2 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (5.5, 1.8, I)	2 2 1 2 1 1 2 3 4 5 6 7 8 9 (2.5, 1.6, I)	3 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	(127-135)
SINGLE VESSEL DISEASE - ANY VESSEL OTHER THAN PLAD										
4. Ejection fraction >50%	2 3 3 1 2 3 4 5 6 7 8 9 (7.0, 0.6, A)	1 1 2 4 1 2 3 4 5 6 7 8 9 (3.5, 0.9, A)	3 2 3 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	1 2 4 1 1 2 3 4 5 6 7 8 9 (7.0, 1.0, A)	1 2 3 2 1 2 3 4 5 6 7 8 9 (3.0, 0.8, A)	5 1 2 1 2 3 4 5 6 7 8 9 (7.0, 0.6, A)	1 2 1 3 1 1 2 3 4 5 6 7 8 9 (4.5, 1.8, I)	4 2 1 1 1 2 3 4 5 6 7 8 9 (1.5, 0.9, A)	2 3 2 1 1 2 3 4 5 6 7 8 9 (7.0, 0.8, A)	(136-144)
5. Ejection fraction 25-49%	2 3 3 1 2 3 4 5 6 7 8 9 (7.0, 0.6, A)	1 1 3 3 1 2 3 4 5 6 7 8 9 (3.0, 0.8, A)	3 2 3 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	1 2 4 1 1 2 3 4 5 6 7 8 9 (7.0, 1.0, A)	1 2 3 2 1 2 3 4 5 6 7 8 9 (3.0, 0.8, A)	5 1 2 1 2 3 4 5 6 7 8 9 (7.0, 0.6, A)	1 2 2 2 1 1 2 3 4 5 6 7 8 9 (4.0, 1.6, I)	4 2 1 1 1 2 3 4 5 6 7 8 9 (1.5, 0.9, A)	2 3 2 1 1 2 3 4 5 6 7 8 9 (7.0, 0.8, A)	(145-153)
6. Ejection fraction <25%	1 3 2 2 1 2 3 4 5 6 7 8 9 (6.5, 1.1, A)	2 2 2 2 1 2 3 4 5 6 7 8 9 (2.5, 1.0, I)	4 2 2 1 2 3 4 5 6 7 8 9 (7.5, 0.8, A)	1 3 2 1 1 1 2 3 4 5 6 7 8 9 (5.5, 1.1, A)	2 3 2 1 1 2 3 4 5 6 7 8 9 (2.0, 0.8, A)	5 2 1 1 2 3 4 5 6 7 8 9 (7.0, 0.5, A)	3 1 1 2 1 1 2 3 4 5 6 7 8 9 (3.5, 2.0, I)	4 2 1 1 1 2 3 4 5 6 7 8 9 (1.5, 0.9, A)	1 4 3 1 2 3 4 5 6 7 8 9 (7.0, 0.5, A)	(154-162)

[illegible] 1 = extremely inappropriate, 5 = equivocal, 9 = extremely appropriate

	NORMAL OR LOW RISK			MODERATELY HIGH RISK			VERY HIGH RISK			
	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	
THIN 21 DAYS AFTER AMI; PATIENT IS MPTOMATIC, WITH VERY POSITIVE EXERCISE ECG										
LEFT MAIN DISEASE										
1. Ejection fraction >50%	1 7 1 2 3 4 5 6 7 8 9)9.0, 0.2, A)	1 7 1 2 3 4 5 6 7 8 9)9.0, 0.2, A)	1 2 5 1 2 3 4 5 6 7 8 9 (5.0, 1.0, A)	1 7 1 2 3 4 5 6 7 8 9)9.0, 0.4, A)	1 7 1 2 3 4 5 6 7 8 9 (9.0, 0.2, A)	1 1 2 4 1 2 3 4 5 6 7 8 9 (4.0, 1.4, I)	1 2 1 4 1 2 3 4 5 6 7 8 9 (8.5, 1.0, A)	1 2 1 4 1 2 3 4 5 6 7 8 9 (8.5, 1.1, A)	1 1 4 2 1 2 3 4 5 6 7 8 9 (5.0, 1.0, I)	(163-171)
2. Ejection fraction 25-49%	1 7 1 2 3 4 5 6 7 8 9 (9.0, 0.2, A)	1 7 1 2 5 1 2 3 4 5 6 7 8 9)9.0, 0.2, A)	1 2 5 1 2 3 4 5 6 7 8 9 (5.0, 1.0, A)	1 7 1 2 3 4 5 6 7 8 9 (9.0, 0.5, A)	1 7 1 2 3 4 5 6 7 8 9 (9.0, 0.2, A)	1 1 2 4 1 2 3 4 5 6 7 8 9 (4.0, 1.4, I)	1 3 1 3 1 2 3 4 5 6 7 8 9 (7.5, 1.0, A)	1 3 1 3 1 2 3 4 5 6 7 8 9 (7.5, 1.1, A)	1 1 4 2 1 2 3 4 5 6 7 8 9 (5.0, 1.0, I)	(172-180)
3. Ejection fraction <25%	1 1 1 5 1 2 3 4 5 6 7 8 9)9.0, 1.2, I)	2 1 5 1 2 5 1 2 3 4 5 6 7 8 9 (9.0, 1.0, I)	1 2 5 1 2 3 4 5 6 7 8 9 (5.0, 1.0, A)	2 1 5 1 2 3 4 5 6 7 8 9)9.0, 1.5, I)	1 2 5 1 2 3 4 5 6 7 8 9)9.0, 1.1, A)	1 1 2 4 1 2 3 4 5 6 7 8 9 (4.0, 1.4, I)	1 3 1 3 1 2 3 4 5 6 7 8 9 (6.5, 1.9, I)	1 1 1 1 3 1 2 3 4 5 6 7 8 9 (7.5, 2.0, I)	1 1 4 2 1 2 3 4 5 6 7 8 9 (5.0, 1.0, I)	(181-189)
THREE VESSEL DISEASE										
1. Ejection fraction >50%	2 3 3 1 2 3 4 5 6 7 8 9)8.0, 0.6, A)	1 2 2 2 1 1 2 3 4 5 6 7 8 9)7.0, 1.4, A)	1 3 4 1 2 3 4 5 6 7 8 9 (7.5, 0.8, A)	1 1 2 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.2, I)	1 1 2 2 1 1 2 3 4 5 6 7 8 9)7.0, 1.5, I)	1 3 3 1 1 2 3 4 5 6 7 8 9)7.5, 1.0, A)	1 1 2 2 1 1 1 2 3 4 5 6 7 8 9 (6.5, 1.4, I)	1 1 3 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.4, I)	1 1 2 3 1 1 2 3 4 5 6 7 8 9 (7.5, 1.2, A)	(190-198)
2. Ejection fraction 25-49%	1 4 3 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	1 2 1 3 1 1 2 3 4 5 6 7 8 9 (7.5, 1.5, A)	1 3 4 1 2 3 4 5 6 7 8 9 (7.5, 0.8, A)	2 1 2 3 1 2 3 4 5 6 7 8 9 (8.0, 1.2, I)	1 1 1 1 3 1 1 2 3 4 5 6 7 8 9 (7.5, 1.6, I)	1 3 3 1 1 2 3 4 5 6 7 8 9)7.5, 0.9, A)	1 1 3 2 1 1 2 3 4 5 6 7 8 9 (6.0, 1.4, I)	2 3 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.6, D)	1 1 2 3 1 1 2 3 4 5 6 7 8 9 (7.5, 1.2, A)	(199-207)
3. Ejection fraction <25%	1 1 1 1 4 1 2 3 4 5 6 7 8 9 (8.5, 1.5, I)	2 1 2 1 1 2 3 4 5 6 7 8 9 (6.0, 2.1, D)	2 1 2 2 1 1 2 3 4 5 6 7 8 9)7.0, 1.1, I)	2 1 1 1 1 1 2 3 4 5 6 7 8 9)7.0, 2.0, I)	2 1 2 2 1 1 2 3 4 5 6 7 8 9 (6.0, 2.0, D)	2 2 1 2 1 1 2 3 4 5 6 7 8 9)6.5, 1.2, I)	2 3 2 1 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.8, D)	1 1 1 1 1 1 2 3 4 5 6 7 8 9 (4.5, 2.4, D)	1 1 2 2 1 1 1 2 3 4 5 6 7 8 9 (6.5, 1.4, I)	(208-216)
TWO VESSEL DISEASE WITH PROXIMAL LEFT ANTERIOR DESCENDING INVOLVEMENT										
1. Ejection fraction >50%	3 3 2 1 2 3 4 5 6 7 8 9)8.0, 0.6, A)	2 2 4 1 2 3 4 5 6 7 8 9 (6.5, 1.5, D)	4 4 1 2 3 4 5 6 7 8 9 (8.0, 1.0, A)	2 3 1 2 1 2 3 4 5 6 7 8 9)7.0, 0.9, I)	2 1 5 1 2 3 4 5 6 7 8 9)7.0, 1.4, D)	1 3 4 1 2 3 4 5 6 7 8 9 (8.0, 1.1, A)	1 2 2 1 1 1 1 2 3 4 5 6 7 8 9 (6.0, 1.4, I)	3 1 3 1 1 2 3 4 5 6 7 8 9 (4.0, 1.6, I)	1 1 2 1 3 1 2 3 4 5 6 7 8 9 (7.5, 1.5, I)	(217-225)
2. Ejection fraction 25-49%	4 2 2 1 2 3 4 5 6 7 8 9)7.5, 0.8, A)	2 1 4 1 1 2 3 4 5 6 7 8 9)7.0, 1.5, D)	1 3 1 3 1 2 3 4 5 6 7 8 9 (7.5, 1.0, A)	1 2 1 2 2 1 2 3 4 5 6 7 8 9)7.5, 1.2, I)	2 1 4 1 1 2 3 4 5 6 7 8 9 (7.0, 1.5, D)	2 2 1 3 1 2 3 4 5 6 7 8 9 (7.5, 1.1, I)	1 1 2 2 1 1 1 2 3 4 5 6 7 8 9 (5.5, 1.5, I)	3 1 2 1 1 1 2 3 4 5 6 7 8 9 (4.0, 1.8, I)	1 2 1 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.5, I)	)226-234)
3. Ejection fraction <25%	2 1 3 2 1 2 3 4 5 6 7 8 9 (8.0, 1.2, I)	2 1 1 2 2 1 2 3 4 5 6 7 8 9 (5.5, 2.4, D)	1 3 1 3 1 2 3 4 5 6 7 8 9 (7.5, 1.1, A)	2 1 1 2 2 1 2 3 4 5 6 7 8 9)7.5, 1.8, I)	2 1 1 3 1 1 2 3 4 5 6 7 8 9 (5.5, 2.2, D)	1 1 3 3 1 2 3 4 5 6 7 8 9)7.0, 1.1, I)	1 2 2 1 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.9, D)	2 2 1 1 1 1 1 2 3 4 5 6 7 8 9 (3.0, 2.0, I)	1 1 1 3 2 1 2 3 4 5 6 7 8 9 (7.0, 1.4, I)	(235-243)
TWO VESSEL DISEASE WITHOUT PROXIMAL LEFT ANTERIOR DESCENDING INVOLVEMENT										
1. Ejection fraction >50%	1 4 3 1 2 3 4 5 6 7 8 9)7.0, 0.8, A)	2 1 4 1 1 2 3 4 5 6 7 8 9 (5.0, 1.1, I)	1 1 4 2 1 2 3 4 5 6 7 8 9 (7.0, 1.0, I)	1 2 2 3 1 2 3 4 5 6 7 8 9 (7.0, 1.2, A)	2 1 4 1 1 2 3 4 5 6 7 8 9 (5.0, 1.1, I)	1 1 4 2 1 2 3 4 5 6 7 8 9 (7.0, 1.2, I)	1 1 3 1 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.6, I)	1 3 1 2 1 1 2 3 4 5 6 7 8 9 (2.5, 1.5, I)	1 3 2 2 1 2 3 4 5 6 7 8 9)6.5, 1.6, I)	(244-252)
2. Ejection fraction 25-49%	1 1 2 3 1 1 2 3 4 5 6 7 8 9)7.5, 1.1, A)	2 1 3 1 1 1 2 3 4 5 6 7 8 9)5.0, 1.5, I)	1 1 4 2 1 2 3 4 5 6 7 8 9)7.0, 1.1, I)	1 2 3 1 1 2 3 4 5 6 7 8 9)8.0, 1.9, I)	2 1 1 2 1 1 2 3 4 5 6 7 8 9 (4.0, 1.6, I)	1 1 4 2 1 2 3 4 5 6 7 8 9)7.0, 1.4, I)	1 2 2 1 1 1 3 1 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.8, I)	1 3 1 2 1 1 2 3 4 5 6 7 8 9 (2.5, 1.6, I)	1 1 2 2 2 1 2 3 4 5 6 7 8 9 (6.5, 1.8, I)	(253-261)
3. Ejection fraction <25%	1 2 1 3 1 1 3 1 1 1 1 2 3 4 5 6 7 8 9 (7.0, 2.0, I)	2 2 2 2 1 2 3 4 5 6 7 8 9 (2.5, 1.9, I)	1 1 1 2 2 1 2 3 4 5 6 7 8 9 (6.5, 1.5, I)	1 2 1 1 3 1 1 1 2 1 1 2 3 4 5 6 7 8 9)6.0, 2.6, D)	3 1 2 1 1 2 3 4 5 6 7 8 9)2.5, 1.8, I)	1 1 2 2 2 1 2 3 4 5 6 7 8 9)6.5, 1.6, I)	1 2 2 1 1 2 3 2 1 1 2 3 4 5 6 7 8 9 (5.0, 2.2, D)	1 1 1 1 2 2 1 2 3 4 5 6 7 8 9 (2.0, 1.6, I)	1 1 1 1 2 2 1 2 3 4 5 6 7 8 9 (6.5, 2.0, I)	(262-270)

apter 4

ST MYOCARDIAL INFARCTION

	NORMAL OR LOW RISK			MODERATELY HIGH RISK			VERY HIGH RISK			
	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	
SINGLE VESSEL DISEASE - PROXIMAL LEFT ANTERIOR DESCENDING										
1. Ejection fraction >50%	1 3 4 1 2 3 4 5 6 7 8 9 (7.5, 0.6, A)	2 1 2 1 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.6, D)	1 2 2 3 1 2 3 4 5 6 7 8 9 (8.0, 0.9, A)	1 2 3 2 1 2 3 4 5 6 7 8 9 (7.0, 0.8, A)	2 1 1 2 1 1 1 2 3 4 5 6 7 8 9 (4.5, 1.5, I)	2 3 3 1 2 3 4 5 6 7 8 9 (7.0, 1.0, I)	1 4 2 1 1 2 3 4 5 6 7 8 9 (5.0, 0.8, A)	1 2 3 1 1 1 2 3 4 5 6 7 8 9 (3.0, 0.9, A)	1 3 1 1 2 1 2 3 4 5 6 7 8 9 (6.5, 1.4, I)	(271-279)
2. Ejection fraction 25-49%	1 4 3 1 2 3 4 5 6 7 8 9 (7.0, 0.5, A)	2 1 2 1 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.6, D)	1 3 1 3 1 2 3 4 5 6 7 8 9 (7.5, 1.0, A)	2 2 2 2 1 2 3 4 5 6 7 8 9 (6.5, 1.0, I)	2 1 1 2 1 1 1 2 3 4 5 6 7 8 9 (4.5, 1.5, I)	3 2 3 1 2 3 4 5 6 7 8 9 (7.0, 1.1, I)	2 4 1 1 1 2 3 4 5 6 7 8 9 (5.0, 0.8, A)	1 3 2 1 1 1 2 3 4 5 6 7 8 9 (2.5, 1.0, A)	1 1 2 1 1 2 1 2 3 4 5 6 7 8 9 (6.5, 1.5, I)	(280-288)
3. Ejection fraction <25%	2 2 2 1 1 1 2 3 4 5 6 7 8 9 (6.5, 1.1, I)	2 2 1 2 1 1 2 3 4 5 6 7 8 9 (3.5, 1.6, I)	1 2 1 4 1 2 3 4 5 6 7 8 9 (8.0, 1.5, I)	2 1 1 3 1 1 2 3 4 5 6 7 8 9 (6.5, 1.2, I)	2 2 2 1 1 1 2 3 4 5 6 7 8 9 (3.5, 1.2, I)	2 1 2 3 1 2 3 4 5 6 7 8 9 (7.0, 1.4, I)	1 1 4 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.1, I)	2 3 2 1 1 2 3 4 5 6 7 8 9 (2.0, 0.9, A)	1 2 1 1 1 2 1 2 3 4 5 6 7 8 9 (6.5, 1.6, I)	(289-297)
SINGLE VESSEL DISEASE - ANY VESSEL OTHER THAN PLAD										
a. Ejection fraction >50%	1 2 4 1 1 2 3 4 5 6 7 8 9 (7.0, 1.1, A)	1 3 2 1 1 1 2 3 4 5 6 7 8 9 (2.5, 1.0, A)	1 1 4 2 1 2 3 4 5 6 7 8 9 (7.0, 1.1, I)	1 2 1 1 2 1 1 2 3 4 5 6 7 8 9 (5.5, 1.6, I)	2 3 2 1 1 2 3 4 5 6 7 8 9 (2.0, 0.9, A)	1 1 4 2 1 2 3 4 5 6 7 8 9 (7.0, 1.2, I)	1 1 3 2 1 1 2 3 4 5 6 7 8 9 (3.0, 1.5, I)	3 4 1 1 2 3 4 5 6 7 8 9 (2.0, 0.8, A)	1 1 3 1 2 1 2 3 4 5 6 7 8 9 (6.0, 1.6, I)	(298-306)
b. Ejection fraction 25-49%	1 3 3 1 1 2 3 4 5 6 7 8 9 (6.0, 1.4, A)	1 3 3 1 1 2 3 4 5 6 7 8 9 (2.5, 0.9, A)	1 3 2 2 1 2 3 4 5 6 7 8 9 (6.5, 1.4, I)	1 3 1 2 1 1 2 3 4 5 6 7 8 9 (4.5, 1.6, I)	2 4 1 1 1 2 3 4 5 6 7 8 9 (2.0, 0.8, A)	1 2 3 2 1 2 3 4 5 6 7 8 9 (7.0, 1.4, I)	1 2 2 2 1 1 2 3 4 5 6 7 8 9 (3.0, 1.6, I)	3 4 1 1 2 3 4 5 6 7 8 9 (2.0, 0.8, A)	1 2 2 1 2 1 2 3 4 5 6 7 8 9 (6.0, 1.8, I)	(307-315)
c. Ejection fraction <25%	2 2 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.3, I)	1 4 1 1 1 2 3 4 5 6 7 8 9 (2.0, 0.7, I)	1 2 1 2 2 1 2 3 4 5 6 7 8 9 (6.5, 1.6, I)	1 1 3 1 1 1 2 3 4 5 6 7 8 9 (4.0, 1.3, I)	3 3 1 1 2 3 4 5 6 7 8 9 (2.0, 0.9, I)	1 2 1 2 2 1 2 3 4 5 6 7 8 9 (6.5, 1.8, I)	3 1 2 1 1 1 2 3 4 5 6 7 8 9 (2.5, 1.8, I)	4 3 1 1 2 3 4 5 6 7 8 9 (1.5, 0.9, A)	1 2 2 1 2 1 2 3 4 5 6 7 8 9 (6.0, 1.8, I)	(316-324)

Appropriateness scale: 1 = extremely inappropriate, 5 = equivocal, 9 = extremely appropriate

apter 4

ST MYOCARDIAL INFARCTION

	NORMAL OR LOW RISK			MODERATELY HIGH RISK			VERY HIGH RISK			
	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	
THIN 21 DAYS AFTER AMI; PATIENT IS YMPTOMATIC - WITH NEGATIVE TO MINIMALLY SITIVE EXERCISE ECG										
ANSMURAL (Q-WAVE) OR NON-TRANSMURAL OCARDIAL INFARCTION										
LEFT MAIN DISEASE										
1. Ejection fraction >50%	2 2 4 1 2 3 4 5 6 7 8 9 (8.5, 0.8, A)	2 2 4 1 2 3 4 5 6 7 8 9 (8.5, 0.8, A)	1 2 5 1 2 3 4 5 6 7 8 9 (5.0, 1.0, A)	1 2 2 3 1 2 3 4 5 6 7 8 9 (8.0, 0.9, A)	1 2 2 3 1 2 3 4 5 6 7 8 9 (8.0, 1.0, A)	1 2 4 1 1 2 3 4 5 6 7 8 9 (5.0, 1.5, A)	1 1 1 1 1 1 2 1 2 3 4 5 6 7 8 9 (6.5, 1.9, I)	1 2 1 1 1 2 1 2 3 4 5 6 7 8 9 (6.5, 1.9, I)	1 2 4 1 1 2 3 4 5 6 7 8 9 (5.0, 1.5, A)	(325-333)
2. Ejection fraction 25-49%	1 1 2 4 1 2 3 4 5 6 7 8 9 (8.5, 0.9, A)	1 1 2 4 1 2 3 4 5 6 7 8 9 (8.5, 0.9, A)	1 2 5 1 2 3 4 5 6 7 8 9 (5.0, 1.0, A)	1 2 2 3 1 2 3 4 5 6 7 8 9 (8.0, 1.0, A)	1 2 2 3 1 2 3 4 5 6 7 8 9 (8.0, 1.1, A)	1 2 4 1 1 2 3 4 5 6 7 8 9 (5.0, 1.5, A)	2 1 1 1 1 2 1 2 3 4 5 6 7 8 9 (6.5, 2.0, D)	1 1 1 1 1 1 2 1 2 3 4 5 6 7 8 9 (6.5, 2.0, I)	1 2 4 1 1 2 3 4 5 6 7 8 9 (5.0, 1.5, A)	(334-342)
3. Ejection fraction <25%	2 2 1 3 1 2 3 4 5 6 7 8 9 (7.5, 1.4, I)	2 2 1 3 1 2 3 4 5 6 7 8 9 (7.5, 1.4, I)	1 2 5 1 2 3 4 5 6 7 8 9 (5.0, 1.0, A)	1 1 1 2 1 2 1 2 3 4 5 6 7 8 9 (7.0, 1.4, I)	1 1 1 2 1 2 1 2 3 4 5 6 7 8 9 (7.0, 1.4, I)	1 2 4 1 1 2 3 4 5 6 7 8 9 (5.0, 1.5, A)	1 1 1 1 1 2 2 1 2 3 4 5 6 7 8 9 (5.5, 2.6, D)	1 1 1 1 2 1 1 2 3 4 5 6 7 8 9 (5.5, 2.6, D)	1 2 4 1 1 2 3 4 5 6 7 8 9 (5.0, 1.5, A)	(343-351)
THREE VESSEL DISEASE										
1. Ejection fraction >50%	2 2 2 2 1 2 3 4 5 6 7 8 9 (6.5, 1.0, I)	4 1 3 1 2 3 4 5 6 7 8 9 (5.5, 0.9, A)	1 2 4 1 1 2 3 4 5 6 7 8 9 (7.0, 1.4, A)	2 3 2 1 1 2 3 4 5 6 7 8 9 (6.0, 0.8, A)	1 4 1 2 1 2 3 4 5 6 7 8 9 (5.0, 0.8, A)	1 2 1 3 1 1 2 3 4 5 6 7 8 9 (6.5, 1.5, A)	1 1 3 2 1 1 2 3 4 5 6 7 8 9 (4.0, 1.4, I)	1 2 5 1 2 3 4 5 6 7 8 9 (5.0, 1.0, A)	1 1 1 4 1 2 3 4 5 6 7 8 9 (6.0, 2.0, D)	(352-360)
2. Ejection fraction 25-49%	2 1 3 1 1 1 2 3 4 5 6 7 8 9 (7.0, 1.0, I)	3 2 2 1 1 1 2 3 4 5 6 7 8 9 (6.0, 1.0, A)	2 4 1 1 2 3 4 5 6 7 8 9 (7.0, 1.4, A)	2 2 2 2 1 2 3 4 5 6 7 8 9 (6.5, 1.0, I)	1 4 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.0, A)	1 2 1 3 1 1 2 3 4 5 6 7 8 9 (6.5, 1.5, A)	1 2 1 2 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.9, D)	1 1 2 3 1 1 2 3 4 5 6 7 8 9 (4.5, 1.2, A)	1 1 1 4 1 2 3 4 5 6 7 8 9 (6.0, 2.0, D)	(361-369)
3. Ejection fraction <25%	1 1 1 2 2 1 1 2 3 4 5 6 7 8 9 (6.0, 1.9, I)	1 5 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.4, I)	1 3 1 1 2 1 2 3 4 5 6 7 8 9 (5.5, 1.6, I)	1 1 4 2 1 2 3 4 5 6 7 8 9 (6.0, 1.4, I)	1 2 2 1 2 1 2 3 4 5 6 7 8 9 (5.0, 1.6, I)	1 3 1 2 1 1 2 3 4 5 6 7 8 9 (5.5, 1.5, A)	2 1 3 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.9, D)	2 1 2 2 1 1 2 3 4 5 6 7 8 9 (4.0, 1.5, I)	1 1 3 1 2 1 2 3 4 5 6 7 8 9 (5.0, 1.5, D)	(370-378)
TWO VESSEL DISEASE WITH PROXIMAL LEFT ANTERIOR DESCENDING INVOLVEMENT										
1. Ejection fraction >50%	3 1 1 3 1 2 3 4 5 6 7 8 9 (6.5, 1.2, I)	1 1 3 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.0, A)	1 1 1 3 2 1 2 3 4 5 6 7 8 9 (7.0, 1.0, I)	2 3 2 1 1 2 3 4 5 6 7 8 9 (6.0, 0.8, A)	1 1 3 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.0, A)	1 1 2 2 2 1 2 3 4 5 6 7 8 9 (6.5, 1.1, I)	1 1 3 2 1 1 2 3 4 5 6 7 8 9 (4.0, 1.5, I)	1 1 1 5 1 2 3 4 5 6 7 8 9 (5.0, 1.1, I)	1 2 1 2 2 1 2 3 4 5 6 7 8 9 (6.0, 1.8, I)	(379-387)
2. Ejection fraction 25-49%	1 1 2 1 3 1 2 3 4 5 6 7 8 9 (6.5, 1.2, I)	1 1 3 1 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.4, I)	2 2 2 2 1 2 3 4 5 6 7 8 9 (6.5, 1.0, I)	2 4 2 1 2 3 4 5 6 7 8 9 (6.0, 0.8, I)	1 2 2 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.2, A)	2 3 1 2 1 2 3 4 5 6 7 8 9 (6.0, 0.9, I)	1 1 3 1 1 1 1 2 3 4 5 6 7 8 9 (4.0, 1.5, D)	1 1 1 1 3 1 1 2 3 4 5 6 7 8 9 (4.5, 1.5, I)	1 1 2 1 1 2 1 2 3 4 5 6 7 8 9 (5.5, 1.5, I)	(388-396)
3. Ejection fraction <25%	1 1 2 1 2 1 1 2 3 4 5 6 7 8 9 (5.5, 1.8, I)	1 1 3 1 1 1 1 2 3 4 5 6 7 8 9 (4.0, 1.9, D)	1 2 2 1 1 1 1 2 3 4 5 6 7 8 9 (6.0, 1.2, I)	1 1 2 1 1 2 1 2 3 4 5 6 7 8 9 (5.5, 1.5, I)	1 1 3 1 1 1 1 2 3 4 5 6 7 8 9 (4.0, 1.6, D)	1 2 1 2 1 2 1 2 3 4 5 6 7 8 9 (6.5, 1.2, I)	2 1 1 2 1 1 1 2 3 4 5 6 7 8 9 (4.0, 2.2, D)	2 1 2 2 1 1 2 3 4 5 6 7 8 9 (4.0, 1.6, I)	1 1 1 4 2 1 2 3 4 5 6 7 8 9 (5.0, 1.1, I)	(397-405)
TWO VESSEL DISEASE WITHOUT PROXIMAL LEFT ANTERIOR DESCENDING INVOLVEMENT										
1. Ejection fraction >50%	1 1 1 2 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.5, I)	1 1 1 1 3 1 1 2 3 4 5 6 7 8 9 (4.5, 1.4, I)	1 1 2 1 1 1 1 1 2 3 4 5 6 7 8 9 (4.5, 1.8, O)	1 2 2 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.6, I)	1 1 1 2 3 1 2 3 4 5 6 7 8 9 (4.0, 1.1, I)	1 2 1 1 1 2 1 2 3 4 5 6 7 8 9 (5.0, 2.2, D)	2 1 3 1 1 1 2 3 4 5 6 7 8 9 (4.0, 1.6, I)	1 1 2 2 1 2 3 4 5 6 7 8 9 (3.0, 1.2, I)	1 1 1 1 1 1 2 1 2 3 4 5 6 7 8 9 (5.0, 2.4, D)	(406-414)
2. Ejection fraction 25- 9%	1 2 1 1 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.7, I)	1 1 2 2 1 1 2 3 4 5 6 7 8 9 (4.0, 1.4, I)	1 1 1 2 1 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.6, D)	1 2 1 1 1 1 1 2 3 4 5 6 7 8 9 (5.0, 2.0, O)	1 2 2 1 1 1 1 2 3 4 5 6 7 8 9 (4.0, 1.4, I)	1 2 2 1 1 2 1 2 3 4 5 6 7 8 9 (5.0, 2.0, D)	2 2 1 1 1 1 2 3 4 5 6 7 8 9 (3.0, 2.1, I)	1 2 2 2 1 2 3 4 5 6 7 8 9 (4.0, 1.3, I)	1 1 1 2 1 2 1 2 3 4 5 6 7 8 9 (5.0, 2.1, D)	(415-423)
3. Ejection fraction <25%	2 3 1 1 1 1 2 3 4 5 6 7 8 9 (4.0, 1.8, D)	2 1 1 2 1 1 1 2 3 4 5 6 7 8 9 (3.5, 1.6, I)	1 1 3 2 1 1 2 3 4 5 6 7 8 9 (4.0, 1.5, I)	2 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (3.5, 2.1, O)	2 2 2 1 1 1 2 3 4 5 6 7 8 9 (3.0, 1.6, I)	1 2 1 1 1 2 1 2 3 4 5 6 7 8 9 (4.5, 2.0, D)	3 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (2.5, 2.1, I)	3 1 1 1 2 1 2 3 4 5 6 7 8 9 (2.5, 1.5, I)	1 1 1 1 1 1 2 1 2 3 4 5 6 7 8 9 (4.5, 2.1, D)	(424-432)

apter 4

ST MYOCARDIAL INFARCTION

	NORMAL OR LOW RISK			MODERATELY HIGH RISK			VERY HIGH RISK			
	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	
SINGLE VESSEL DISEASE - PROXIMAL LEFT ANTERIOR DESCENDING										
1. Ejection fraction >50%	1 1 1 2 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.8, D)	1 3 1 1 1 1 1 2 3 4 5 6 7 8 9 (2.5, 1.9, I)	1 1 2 1 3 1 2 3 4 5 6 7 8 9 (6.5, 1.8, D)	1 2 1 3 1 1 2 3 4 5 6 7 8 9 (5.5, 1.8, I)	2 2 1 2 1 1 2 3 4 5 6 7 8 9 (2.5, 1.6, I)	1 1 2 2 2 1 2 3 4 5 6 7 8 9 (6.5, 1.6, D)	3 2 2 1 1 2 3 4 5 6 7 8 9 (4.0, 1.9, I)	3 2 1 2 1 2 3 4 5 6 7 8 9 (2.0, 1.4, I)	1 1 1 2 1 2 1 2 3 4 5 6 7 8 9 (6.0, 1.9, D)	(433-441)
2. Ejection fraction 25-49%	1 2 2 1 1 1 1 2 3 4 5 6 7 8 9 (4.0, 1.8, D)	1 3 1 1 1 1 1 2 3 4 5 6 7 8 9 (2.5, 1.8, I)	1 1 1 3 2 1 2 3 4 5 6 7 8 9 (7.0, 1.6, D)	1 3 1 2 1 1 2 3 4 5 6 7 8 9 (4.0, 1.9, I)	2 2 1 1 1 1 1 2 3 4 5 6 7 8 9 (2.5, 1.5, I)	1 1 1 2 1 2 1 2 3 4 5 6 7 8 9 (6.0, 1.6, D)	3 1 2 1 1 1 2 3 4 5 6 7 8 9 (3.5, 1.9, I)	3 2 2 1 1 2 3 4 5 6 7 8 9 (2.0, 1.2, I)	1 1 1 2 1 2 1 2 3 4 5 6 7 8 9 (5.0, 1.9, D)	(442-450)
3. Ejection fraction <25%	2 1 3 1 1 1 2 3 4 5 6 7 8 9 (4.0, 1.9, O)	2 2 1 2 1 1 2 3 4 5 6 7 8 9 (2.5, 1.8, I)	1 1 1 1 1 3 1 2 3 4 5 6 7 8 9 (5.5, 2.0, O)	2 2 2 1 1 1 2 3 4 5 6 7 8 9 (3.5, 1.9, O)	3 1 1 2 1 1 2 3 4 5 6 7 8 9 (2.5, 1.6, I)	1 1 1 1 1 1 2 1 2 3 4 5 6 7 8 9 (5.5, 1.9, D)	3 1 2 1 1 1 2 3 4 5 6 7 8 9 (2.5, 1.8, I)	3 1 2 1 1 1 2 3 4 5 6 7 8 9 (2.5, 1.2, I)	1 1 2 1 1 2 1 2 3 4 5 6 7 8 9 (4.5, 1.9, D)	(451-459)
SINGLE VESSEL DISEASE - ANY VESSEL OTHER THAN PLAD										
a. Ejection fraction >50%	1 2 1 2 1 1 1 2 3 4 5 6 7 8 9 (3.5, 1.4, I)	3 2 1 2 1 2 3 4 5 6 7 8 9 (2.0, 1.2, I)	1 1 1 2 2 1 1 2 3 4 5 6 7 8 9 (6.0, 1.9, O)	2 1 3 1 1 1 2 3 4 5 6 7 8 9 (3.0, 1.6, I)	3 3 2 1 2 3 4 5 6 7 8 9 (2.0, 1.1, I)	1 1 1 2 2 1 1 2 3 4 5 6 7 8 9 (6.0, 2.0, D)	4 2 1 1 1 2 3 4 5 6 7 8 9 (1.5, 1.5, I)	4 2 2 1 2 3 4 5 6 7 8 9 (1.5, 1.2, I)	2 1 2 2 1 1 2 3 4 5 6 7 8 9 (6.0, 2.2, D)	(460-468)
b. Ejection fraction 25-49%	1 2 2 2 1 1 2 3 4 5 6 7 8 9 (3.0, 1.1, A)	3 3 1 1 1 2 3 4 5 6 7 8 9 (2.0, 1.0, I)	1 1 2 1 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.6, I)	2 2 2 1 1 1 2 3 4 5 6 7 8 9 (2.5, 1.6, I)	3 3 1 1 1 2 3 4 5 6 7 8 9 (2.0, 1.0, I)	1 1 1 2 2 1 1 2 3 4 5 6 7 8 9 (5.0, 2.0, D)	4 2 1 1 1 2 3 4 5 6 7 8 9 (1.5, 1.5, I)	4 2 1 1 1 2 3 4 5 6 7 8 9 (1.5, 1.1, I)	2 1 2 2 1 1 2 3 4 5 6 7 8 9 (5.0, 2.2, O)	(469-477)
c. Ejection fraction <25%	3 2 1 1 2 3 4 5 6 7 8 9 (2.0, 1.2, I)	4 2 1 1 1 2 3 4 5 6 7 8 9 (1.5, 1.1, I)	1 1 3 1 1 1 1 2 3 4 5 6 7 8 9 (4.0, 1.8, O)	3 1 2 1 1 1 2 3 4 5 6 7 8 9 (2.5, 1.8, I)	4 2 1 1 1 2 3 4 5 6 7 8 9 (1.5, 1.1, I)	1 1 1 2 1 1 1 1 2 3 4 5 6 7 8 9 (4.0, 1.9, D)	5 1 1 1 1 2 3 4 5 6 7 8 9 (1.0, 1.2, A)	4 2 1 1 1 2 3 4 5 6 7 8 9 (1.5, 1.1, I)	2 1 2 1 1 1 1 2 3 4 5 6 7 8 9 (4.0, 2.1, D)	(478-486)

[illegible] = extremely inappropriate, I = appropriate, U = uncertain, A = extremely appropriate

hapter 5

SYMPTOMATIC	NORMAL OR LOW RISK			MODERATELY HIGH RISK			VERY HIGH RISK			
	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	
ITH VERY POSITIVE EXERCISE ECG										
Left main disease										
1. Ejection fraction >=50%	8 1 2 3 4 5 6 7 8 9 (9.0, 0.0, A)	8 1 2 3 4 5 6 7 8 9 (9.0, 0.0, A)	2 2 4 1 2 3 4 5 6 7 8 9 14.0, 1.5, I)	8 1 2 3 4 5 6 7 8 9 19.0, 0.0, A)	8 1 2 3 4 5 6 7 8 9 (9.0, 0.0, A)	8 2 2 4 1 2 3 4 5 6 7 8 9 (4.0, 1.5, I)	1 5 2 1 2 3 4 5 6 7 8 9 (8.0, 0.4, A)	2 3 3 1 2 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	1 2 3 4 5 6 7 8 9 (5.0, 1.1, A)	(1- 9)
2. Ejection fraction <50%	8 1 2 3 4 5 6 7 8 9 (9.0, 0.0, A)	8 1 2 3 4 5 6 7 8 9 (9.0, 0.0, A)	2 2 4 1 2 3 4 5 6 7 8 9 (4.0, 1.5, I)	8 1 2 3 4 5 6 7 8 9 (9.0, 0.0, A)	8 1 2 3 4 5 6 7 8 9 (9.0, 0.0, A)	8 2 2 4 1 2 3 4 5 6 7 8 9 (4.0, 1.5, I)	2 4 2 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	3 2 3 1 2 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	1 2 3 4 5 6 7 8 9 (5.0, 1.1, A)	(10- 18)
Three vessel disease										
1. Ejection fraction >=50%	1 1 2 4 1 2 3 4 5 6 7 8 9 18.5, 0.9, A)	1 2 1 3 1 1 2 3 4 5 6 7 8 9 17.5, 1.6, I)	1 1 4 2 1 2 3 4 5 6 7 8 9 18.0, 0.6, A)	1 1 2 2 2 1 2 3 4 5 6 7 8 9 17.5, 1.5, I)	1 2 2 2 1 1 2 3 4 5 6 7 8 9 17.0, 1.5, I)	1 2 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	1 3 2 1 1 2 3 4 5 6 7 8 9 (6.0, 1.4, A)	1 1 4 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.0, I)	2 1 4 1 1 2 3 4 5 6 7 8 9 (8.0, 0.8, A)	(19- 27)
2. Ejection fraction <50%	3 5 1 2 3 4 5 6 7 8 9 19.0, 0.4, A)	1 1 2 3 1 1 2 3 4 5 6 7 8 9 17.5, 1.4, I)	3 3 2 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	1 2 2 3 1 2 3 4 5 6 7 8 9 (8.0, 1.4, A)	1 1 2 1 2 1 1 2 3 4 5 6 7 8 9 (6.5, 1.5, I)	4 3 1 1 2 3 4 5 6 7 8 9 (7.5, 0.6, A)	1 4 1 1 1 2 3 4 5 6 7 8 9 (6.0, 1.4, I)	2 4 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.1, I)	1 3 3 1 1 2 3 4 5 6 7 8 9 (7.5, 0.8, A)	(28- 36)
Two vessel disease with proximal left anterior descending involvement										
1. Ejection fraction >=50%	1 1 4 2 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	1 1 1 4 1 1 2 3 4 5 6 7 8 9 17.0, 1.5, D)	1 1 3 3 1 2 3 4 5 6 7 8 9 18.0, 0.8, A)	1 2 1 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.6, I)	1 1 1 1 4 1 2 3 4 5 6 7 8 9 (6.5, 1.5, D)	2 1 2 3 1 2 3 4 5 6 7 8 9 18.0, 1.0, I)	1 1 1 3 1 1 2 4 1 1 2 3 4 5 6 7 8 9 (6.0, 1.5, I)	1 2 3 4 5 6 7 8 9 (5.0, 1.4, I)	1 1 1 3 2 1 2 3 4 5 6 7 8 9 (8.0, 1.1, I)	(37- 45)
2. Ejection fraction <50%	1 5 2 1 2 3 4 5 6 7 8 9 (8.0, 0.4, A)	1 1 1 3 2 1 2 3 4 5 6 7 8 9 (7.0, 1.5, D)	3 2 3 1 2 3 4 5 6 7 8 9 18.0, 0.8, A)	1 1 1 3 2 1 2 3 4 5 6 7 8 9 (8.0, 1.4, I)	1 1 3 3 1 2 3 4 5 6 7 8 9 (6.0, 1.2, D)	1 3 1 3 1 2 3 4 5 6 7 8 9 (7.5, 1.0, A)	1 1 1 2 2 1 1 2 4 1 1 2 3 4 5 6 7 8 9 16.0, 1.6, I)	1 2 3 4 5 6 7 8 9 (5.0, 1.5, I)	1 3 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.1, A)	(46- 54)
Two vessel disease without proximal left anterior descending involvement										
1. Ejection fraction >=50%	1 1 1 2 3 1 2 3 4 5 6 7 8 9 (7.0, 1.1, I)	1 3 3 1 1 2 3 4 5 6 7 8 9 (4.0, 1.2, A)	2 2 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.0, I)	1 1 1 2 1 2 1 2 3 4 5 6 7 8 9 (6.0, 1.6, D)	2 2 4 1 2 3 4 5 6 7 8 9 14.0, 1.2, I)	3 1 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.1, I)	1 1 1 3 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.5, I)	1 3 3 1 1 2 3 4 5 6 7 8 9 (2.5, 0.8, A)	1 3 2 2 1 2 3 4 5 6 7 8 9 (6.5, 1.5, I)	(55- 63)
2. Ejection fraction <50%	1 2 2 3 1 2 3 4 5 6 7 8 9 17.0, 1.0, A)	1 2 1 3 1 1 2 3 4 5 6 7 8 9 (4.5, 1.2, A)	1 3 2 2 1 2 3 4 5 6 7 8 9 (7.5, 0.9, A)	1 1 1 1 2 2 1 2 3 4 5 6 7 8 9 (6.5, 1.8, D)	2 1 1 3 1 1 2 3 4 5 6 7 8 9 14.5, 1.4, I)	2 2 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.0, I)	1 1 1 3 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.5, I)	1 3 2 1 1 1 2 3 4 5 6 7 8 9 (2.5, 1.0, A)	1 2 3 2 1 2 3 4 5 6 7 8 9 (7.0, 1.4, I)	(64- 72)
Single vessel disease - proximal left anterior descending										
1. Ejection fraction >=50%	1 1 1 5 1 2 3 4 5 6 7 8 9 (8.0, 1.0, I)	2 2 3 1 1 2 3 4 5 6 7 8 9 (4.0, 1.6, I)	2 4 2 1 2 3 4 5 6 7 8 9 (8.0, 0.5, A)	1 1 1 2 3 1 2 3 4 5 6 7 8 9 17.0, 1.6, I)	3 1 1 2 1 1 2 3 4 5 6 7 8 9 (3.5, 1.4, I)	3 3 2 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	1 1 1 1 2 1 1 1 4 2 1 1 2 3 4 5 6 7 8 9 (4.5, 1.9, D)	1 2 3 4 5 6 7 8 9 (2.0, 0.8, A)	1 3 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.1, A)	(73- 81)
2. Ejection fraction <50%	1 3 4 1 2 3 4 5 6 7 8 9 17.5, 0.8, A)	2 1 1 3 1 1 2 3 4 5 6 7 8 9 (4.5, 1.5, I)	1 2 3 2 1 2 3 4 5 6 7 8 9 18.0, 0.8, A)	1 1 1 3 2 1 2 3 4 5 6 7 8 9 (7.0, 1.2, I)	2 1 2 2 1 1 2 3 4 5 6 7 8 9 (4.0, 1.1, I)	1 3 2 2 1 2 3 4 5 6 7 8 9 17.5, 0.9, A)	1 1 2 3 1 1 4 2 1 1 2 3 4 5 6 7 8 9 (4.5, 1.4, A)	1 2 3 4 5 6 7 8 9 (2.0, 0.8, A)	1 1 3 2 1 2 3 4 5 6 7 8 9 (7.0, 1.1, I)	(82- 90)
Single vessel disease - any vessel other than PLAD										
1. Ejection fraction >=50%	3 1 2 2 1 2 3 4 5 6 7 8 9 15.5, 1.8, D)	2 1 3 1 1 1 2 3 4 5 6 7 8 9 13.0, 1.0, I)	1 2 3 1 1 2 3 4 5 6 7 8 9 (7.0, 1.4, I)	1 3 2 1 1 1 2 3 4 5 6 7 8 9 (3.5, 2.1, I)	2 1 4 1 1 2 3 4 5 6 7 8 9 (3.0, 0.9, A)	1 2 1 2 1 1 2 3 4 5 6 7 8 9 16.0, 1.7, I)	3 2 1 1 1 2 5 1 1 2 3 4 5 6 7 8 9 (2.0, 1.5, I)	1 2 3 4 5 6 7 8 9 (2.0, 0.6, A)	1 2 2 1 1 2 3 4 5 6 7 8 9 (6.0, 2.0, I)	(91- 99)
2. Ejection fraction <50%	1 2 2 1 2 1 2 3 4 5 6 7 8 9 (5.0, 1.8, D)	2 1 2 2 1 1 2 3 4 5 6 7 8 9 (3.0, 1.1, I)	1 2 3 1 1 2 3 4 5 6 7 8 9 17.0, 1.4, I)	1 3 1 1 1 1 1 2 3 4 5 6 7 8 9 13.0, 2.0, I)	2 1 3 1 1 1 2 3 4 5 6 7 8 9 13.0, 1.0, I)	1 2 1 2 1 1 2 3 4 5 6 7 8 9 16.0, 1.7, I)	3 2 1 1 1 2 5 1 1 2 3 4 5 6 7 8 9 12.0, 1.5, I)	1 2 3 4 5 6 7 8 9 (2.0, 0.6, A)	1 2 2 1 1 2 3 4 5 6 7 8 9 (6.0, 2.0, I)	(100-108)

Chapter 5

SYMPTOMATIC	NORMAL OR LOW RISK			MODERATELY HIGH RISK			VERY HIGH RISK			
	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	
WITH NEGATIVE TO MINIMALLY POSITIVE EXERCISE ECG										
Left main disease										
1. Ejection fraction >=50%	3 5 1 2 3 4 5 6 7 8 9 (9.0, 0.4, A)	3 5 1 2 3 4 5 6 7 8 9 (9.0, 0.4, A)	2 4 2 1 2 3 4 5 6 7 8 9 (2.0, 1.0, I)	1 2 5 1 2 3 4 5 6 7 8 9 (9.0, 0.6, A)	1 2 5 1 2 3 4 5 6 7 8 9 (9.0, 0.6, A)	2 3 2 1 1 2 3 4 5 6 7 8 9 (2.0, 1.9, I)	1 2 1 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.9, I)	3 1 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.5, I)	2 3 2 1 1 2 3 4 5 6 7 8 9 (2.0, 1.8, I)	(109-117)
2. Ejection fraction <50%	3 5 1 2 3 4 5 6 7 8 9 (9.0, 0.4, A)	3 5 1 2 3 4 5 6 7 8 9 (9.0, 0.4, A)	2 4 2 1 2 3 4 5 6 7 8 9 (2.0, 1.0, I)	1 2 5 1 2 3 4 5 6 7 8 9 (9.0, 0.6, A)	1 2 5 1 2 3 4 5 6 7 8 9 (9.0, 0.6, A)	2 3 2 1 1 2 3 4 5 6 7 8 9 (2.0, 1.9, I)	1 2 1 1 2 1 2 3 4 5 6 7 8 9 (6.5, 1.9, I)	3 1 1 2 1 2 3 4 5 6 7 8 9 (6.5, 1.5, I)	2 3 2 1 1 2 3 4 5 6 7 8 9 (2.0, 1.6, I)	(118-126)
Three vessel disease										
1. Ejection fraction >=50%	1 3 1 2 1 1 2 3 4 5 6 7 8 9 (5.5, 1.6, I)	1 1 3 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.4, I)	1 4 1 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.2, A)	1 4 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.1, A)	1 1 1 5 1 2 3 4 5 6 7 8 9 (5.0, 1.0, I)	1 5 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.0, A)	1 1 1 4 1 1 2 3 4 5 6 7 8 9 (5.0, 1.2, I)	1 2 5 1 2 3 4 5 6 7 8 9 (5.0, 1.2, I)	1 1 5 1 1 2 3 4 5 6 7 8 9 (5.0, 1.0, A)	(127-135)
2. Ejection fraction <50%	1 4 1 1 1 1 2 3 4 5 6 7 8 9 (6.0, 0.9, A)	1 3 2 1 1 1 2 3 4 5 6 7 8 9 (5.5, 1.2, A)	1 3 3 1 1 2 3 4 5 6 7 8 9 (5.5, 1.2, A)	3 2 2 1 1 2 3 4 5 6 7 8 9 (6.0, 0.9, A)	1 5 1 1 1 2 3 4 5 6 7 8 9 (5.0, 0.8, A)	1 5 1 1 1 2 3 4 5 6 7 8 9 (5.0, 0.9, A)	1 1 1 3 2 1 2 3 4 5 6 7 8 9 (5.0, 1.1, I)	2 1 5 1 2 3 4 5 6 7 8 9 (5.0, 1.2, I)	1 1 4 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.0, A)	(136-144)
Two vessel disease with proximal left anterior descending involvement										
1. Ejection fraction >=50%	1 3 1 1 1 1 1 2 3 4 5 6 7 8 9 (4.5, 2.0, I)	1 2 1 1 2 1 1 2 3 4 5 6 7 8 9 (3.5, 1.8, I)	1 2 2 1 1 2 3 4 5 6 7 8 9 (5.0, 1.8, I)	2 3 2 1 1 2 3 4 5 6 7 8 9 (4.0, 1.8, I)	2 2 1 2 1 1 2 3 4 5 6 7 8 9 (3.0, 1.8, I)	1 3 1 2 1 1 2 3 4 5 6 7 8 9 (4.5, 1.5, A)	3 1 1 2 1 1 2 3 4 5 6 7 8 9 (3.5, 1.9, I)	3 2 1 2 1 2 3 4 5 6 7 8 9 (2.0, 1.4, I)	1 1 1 4 1 1 2 3 4 5 6 7 8 9 (5.0, 1.2, A)	(145-153)
2. Ejection fraction <50%	1 2 2 1 1 1 1 2 3 4 5 6 7 8 9 (6.0, 1.2, I)	2 4 1 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.2, I)	1 1 3 1 2 1 2 3 4 5 6 7 8 9 (5.0, 1.5, I)	1 1 4 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.1, A)	1 2 3 2 1 2 3 4 5 6 7 8 9 (5.0, 1.5, I)	1 1 4 1 1 1 2 3 4 5 6 7 8 9 (5.0, 1.0, A)	2 1 1 1 2 1 1 2 3 4 5 6 7 8 9 (3.5, 1.6, I)	4 1 1 1 1 1 2 3 4 5 6 7 8 9 (1.5, 1.6, I)	1 1 5 1 1 2 3 4 5 6 7 8 9 (5.0, 1.0, A)	(154-162)
Two vessel disease without proximal left anterior descending involvement										
1. Ejection fraction >=50%	2 2 2 1 1 1 2 3 4 5 6 7 8 9 (3.5, 1.9, I)	2 3 1 1 1 1 2 3 4 5 6 7 8 9 (2.0, 1.0, I)	2 1 1 2 1 1 1 2 3 4 5 6 7 8 9 (4.5, 1.9, I)	3 1 2 1 1 1 2 3 4 5 6 7 8 9 (3.0, 2.0, I)	4 2 1 1 1 2 3 4 5 6 7 8 9 (1.5, 1.1, I)	2 2 3 1 1 2 3 4 5 6 7 8 9 (4.5, 1.6, I)	3 1 2 1 1 1 2 3 4 5 6 7 8 9 (2.5, 1.5, I)	4 2 2 1 2 3 4 5 6 7 8 9 (1.5, 0.8, A)	2 2 3 1 1 2 3 4 5 6 7 8 9 (4.0, 1.9, I)	(163-171)
2. Ejection fraction <50%	2 2 1 2 1 1 2 3 4 5 6 7 8 9 (3.5, 1.9, I)	2 3 1 1 1 1 2 3 4 5 6 7 8 9 (2.0, 1.0, I)	2 1 1 2 1 1 1 2 3 4 5 6 7 8 9 (4.5, 1.9, I)	3 1 1 2 1 1 2 3 4 5 6 7 8 9 (3.0, 2.1, I)	4 2 1 1 1 2 3 4 5 6 7 8 9 (1.5, 1.1, I)	2 2 3 1 1 2 3 4 5 6 7 8 9 (4.5, 1.5, I)	3 1 2 1 1 1 2 3 4 5 6 7 8 9 (2.5, 1.4, I)	5 1 2 1 2 3 4 5 6 7 8 9 (1.0, 0.6, A)	2 2 3 1 1 2 3 4 5 6 7 8 9 (4.0, 1.8, I)	(172-180)
Single vessel disease - proximal left anterior descending										
1. Ejection fraction >=50%	2 1 2 1 2 1 2 3 4 5 6 7 8 9 (3.0, 2.4, D)	3 2 1 1 1 1 2 3 4 5 6 7 8 9 (2.0, 1.6, I)	1 2 2 1 2 1 2 3 4 5 6 7 8 9 (4.0, 2.0, D)	2 1 2 2 1 1 2 3 4 5 6 7 8 9 (3.0, 1.9, I)	3 2 1 1 1 1 2 3 4 5 6 7 8 9 (2.0, 1.4, I)	1 1 3 2 1 1 2 3 4 5 6 7 8 9 (4.0, 1.5, I)	3 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (2.5, 1.8, I)	3 2 2 1 1 2 3 4 5 6 7 8 9 (2.0, 1.0, A)	2 2 1 1 1 1 2 3 4 5 6 7 8 9 (3.0, 1.7, I)	(181-189)
2. Ejection fraction <50%	1 1 2 1 1 2 1 2 3 4 5 6 7 8 9 (4.0, 2.2, D)	2 2 1 2 1 1 2 3 4 5 6 7 8 9 (2.5, 1.9, I)	1 2 2 1 2 1 2 3 4 5 6 7 8 3 (4.0, 1.9, D)	1 1 2 2 1 1 1 2 3 4 5 6 7 8 9 (4.0, 1.8, I)	2 2 1 1 2 1 2 3 4 5 6 7 8 9 (2.5, 1.8, I)	1 1 3 1 1 1 1 2 3 4 5 6 7 8 9 (4.0, 1.2, I)	3 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (2.5, 1.6, I)	4 1 2 1 1 2 3 4 5 6 7 8 9 (1.5, 1.1, A)	2 2 1 1 1 1 2 3 4 5 6 7 8 9 (3.0, 1.6, I)	(190-198)
Single vessel disease - any vessel other than PLAD										
1. Ejection fraction >=50%	3 1 2 1 1 1 2 3 4 5 6 7 8 9 (2.5, 1.6, I)	3 2 2 1 1 2 3 4 5 6 7 8 9 (2.0, 1.0, A)	2 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (3.0, 1.9, I)	4 3 1 1 2 3 4 5 6 7 8 9 (2.0, 1.5, A)	3 3 1 1 1 2 3 4 5 6 7 8 9 (2.0, 0.9, A)	3 2 1 1 1 1 2 3 4 5 6 7 8 9 (3.0, 1.8, I)	4 2 1 1 1 2 3 4 5 6 7 8 9 (1.5, 1.2, A)	3 3 1 1 1 2 3 4 5 6 7 8 9 (2.0, 0.9, A)	4 1 1 1 1 2 3 4 5 6 7 8 9 (1.0, 1.9, I)	(199-207)
2. Ejection fraction <50%	4 1 2 1 1 1 2 3 4 5 6 7 8 9 (2.5, 1.6, I)	3 2 2 1 1 2 3 4 5 6 7 8 9 (2.0, 1.0, A)	2 1 1 1 1 1 1 2 3 4 5 6 7 8 9 (3.0, 1.9, I)	4 3 1 1 2 3 4 5 6 7 8 9 (2.0, 1.5, A)	3 3 1 1 1 2 3 4 5 6 7 8 9 (2.0, 0.9, A)	3 2 1 1 1 1 2 3 4 5 6 7 8 9 (3.0, 1.6, I)	4 2 1 1 1 2 3 4 5 6 7 8 9 (1.5, 1.1, A)	5 1 1 1 1 2 3 4 5 6 7 8 9 (1.0, 0.9, A)	4 1 1 1 1 2 3 4 5 6 7 8 9 (1.0, 1.6, I)	(208-216)

apter 6

AR SUDDEN DEATH

	NORMAL OR LOW RISK			MODERATELY HIGH RISK			VERY HIGH RISK			
	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	Appropriateness of CABG, Pt NOT candidate for PTCA	Appropriateness of CABG, Pt IS candidate for PTCA	Appropriateness of PTCA, compared to medical therapy	
THOUT TRANSMURAL MYOCARDIAL INFARCTION; TH ANY ISCHEMIA, ANY ANATOMY, Y EJECTION FRACTION	2 6 1 2 3 4 5 6 7 8 9 (9.0, 0.2, A)	2 3 3 1 2 3 4 5 6 7 8 9 (7.0, 0.9, I)	1 2 5 1 2 3 4 5 6 7 8 9 (9.0, 0.5, A)	2 1 5 1 2 3 4 5 6 7 8 9 (9.0, 0.6, A)	3 3 2 1 2 3 4 5 6 7 8 9 (7.0, 1.0, I)	1 2 5 1 2 3 4 5 6 7 8 9 (9.0, 0.5, A)	4 2 2 1 2 3 4 5 6 7 8 9 (7.5, 0.8, A)	2 3 1 2 1 2 3 4 5 6 7 8 9 (5.0, 1.1, D)	2 3 3 1 2 3 4 5 6 7 8 9 (8.0, 0.6, A)	(1- 9)

apter 8

RONARY REVASCULARIZATION WITH VALVE SURGERY	NORMAL OR LOW RISK Appropriateness of CABG, Pt NOT candidate for PTCA	MODERATELY HIGH RISK Appropriateness of CABG, Pt NOT candidate for PTCA	VERY HIGH RISK Appropriateness of CABG, Pt NOT candidate for PTCA	
Y ISCHEMIC ANATOMY, ANY EJECTION FRACTION	3 5 1 2 3 4 5 6 7 8 9 (9.0, 0.4, A)	1 3 4 1 2 3 4 5 6 7 8 9 (8.5, 0.9, A)	1 2 3 1 1 1 2 3 4 5 6 7 8 9 (7.0, 1.1, A)	(1- 3)

hapter 9

ATIENT HAS SUFFICIENT COMORBIDITIES THAT E/SHE WOULD NOT BE CONSIDERED A CANDIDATE OR BYPASS SURGERY IN THE EVENT OF PTCA AILURE (INCLUDING A MAJOR ACUTE OMPLICATION)	VERY HIGH RISK Appropriateness of PTCA, compared to medical therapy		
HRONIC STABLE ANGINA--SEVERE (CLASS III-IV), NCONTROLLED ON MAXIMUM MEDICAL THERAPY			
Left main disease	1 6 1 1 2 3 4 5 6 7 8 9 (5.0, 0.5, A)		(1)
Three vessel disease	1 2 1 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.2, I)		(2)
Two vessel disease	1 1 3 1 2 1 2 3 4 5 6 7 8 9 (7.0, 1.0, I)		(3)
Single vessel disease	1 1 1 3 2 1 2 3 4 5 6 7 8 9 (8.0, 1.0, I)		(4)
STABLE ANGINA (NOT FOLLOWING MYOCARDIAL FARCTION), NCONTROLLED ON MAXIMUM OICAL THERAPY			
Left main disease	1 5 1 1 1 2 3 4 5 6 7 8 9 (5.0, 0.8, A)		(5)
Three vessel disease	1 1 1 1 4 1 2 3 4 5 6 7 8 9 (8.5, 1.2, I)		(6)
Two vessel disease	1 1 1 1 4 1 2 3 4 5 6 7 8 9 (8.5, 1.2, I)		(7)
Single vessel disease	1 1 2 4 1 2 3 4 5 6 7 8 9 (8.5, 1.1, I)		(8)

[illegible] is extremely appropriate [illegible] is appropriate [illegible]

pter 9

IENT HAS SUFFICIENT COMORBIDITIES THAT SHE WOULD NOT BE CONSIDERED A CANDIDATE BYPASS SURGERY IN THE EVENT OF PTCA LURE (INCLUDING A MAJOR ACUTE PLICATION)	VERY HIGH RISK Appropriateness of PTCA, compared to medical therapy		
TE MYOCARDIAL INFARCTION			
ARDIOGENIC SHOCK			
1. left main disease	1 1 3 3 1 2 3 4 5 6 7 8 9 (5.0, 1.4, D)		(9)
2. Three vessel disease	1 1 1 2 3 1 2 3 4 5 6 7 8 9 (7.0, 1.5, I)		(10)
3. Two vessel disease	1 1 1 1 3 1 1 2 3 4 5 6 7 8 9 (7.5, 1.8, I)		(11)
4. Single vessel disease	1 1 1 1 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.9, I)		(12)
VOLVING MYOCARDIAL INFARCTION, PAIN UNCONTROLLED ON MAXIMUM MEDICAL THERAPY			
1. left main disease	1 4 3 1 2 3 4 5 6 7 8 9 (5.0, 0.8, A)		(13)
2. Three vessel disease	1 2 1 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.6, I)		(14)
3. Two vessel disease	1 1 2 2 2 1 2 3 4 5 6 7 8 9 (7.5, 1.5, I)		(15)
4. Single vessel disease	1 1 1 2 3 1 2 3 4 5 6 7 8 9 (8.0, 1.5, I)		(16)
T MYOCARDIAL INFARCTION (WITHIN 21 DAYS), IN UNCONTROLLED ON MAXIMUM DICAL THERAPY			
left main disease	1 4 2 1 1 2 3 4 5 6 7 8 9 (5.0, 0.9, A)		(17)
Three vessel disease	1 1 1 2 3 1 2 3 4 5 6 7 8 9 (8.0, 1.5, I)		(18)
Two vessel disease	1 1 2 4 1 2 3 4 5 6 7 8 9 (8.5, 1.5, I)		(19)
Single vessel disease	1 1 1 5 1 2 3 4 5 6 7 8 9 (9.0, 1.4, I)		(20)

Appendix D

Clinical Abstract Data Collection Instrument

CLINICAL DATA COLLECTION FORM

FOR

CABG SURGERY PATIENTS

IN THE

MEDICARE PARTICIPATING HEART BYPASS CENTER DEMONSTRATION

GLOSSARY

DEFINITION OF ANGINA

Stable Angina:

Stable angina is a pattern of angina that is predictably brought on by the activities the patient engages in. It is promptly relieved or prevented by sub-lingual nitroglycerine and other antianginal medications. The frequency and severity of episodes do not vary to a significant degree from day to day.

Canadian Cardiovascular Society Classification of Angina:

Class 1:

Ordinary physical activity, such as walking and climbing stairs, does not cause angina. Angina with strenuous, rapid, or prolonged exertion at work or recreation.

Class 2:

Slight limitation of ordinary activity. Walking or climbing stairs rapidly, walking up hill, walking or stair climbing after meals, in cold, in wind, or when under emotional stress or during the first few hours after awakening may cause pain. Walking more than two blocks on the level and climbing more than one flight of ordinary stairs at a normal pace and in normal conditions.

Class 3:

Marked limitation of ordinary physical activity. Walking 1-2 blocks on a level and climbing one flight of stairs at normal conditions results in angina.

Class 4:

Inability to carry on any physical activity without discomfort. Anginal syndrome may by present at rest.

Unstable Angina:

A changing pattern of angina that has distinctly worsened in severity and frequency in comparison to the patient's previous pattern. The chest discomfort of unstable angina, while similar to stable angina, may be more intense and persist for longer periods of time, or may occur at rest.

DEFINITION OF CONGESTIVE HEART FAILURE (CHF)

Congestive Heart Failure is a difficult diagnosis. Usually it is clinically manifest by one or more features including: dyspnea on exertion (DOE- shortness of breath on exertion), bilateral pedal edema, fatigue, orthopnea (sleeping on two or more pillows to facilitate breathing), paroxysmal nocturnal dyspnea (PND - shortness of breath that awakens the patient from sleep). Other findings that support the clinical manifestations include but are not restricted to: presence of S3 gallop by auscultation, elevated jugular venous pressure > 8 cm H20 by physical exam, or radiographic evidence of pulmonary congestion. Verification by a physician's statement in the medical record is required.

Severity of Congestive Heart Failure (CHF) Classifcation:

Classification takes into account only physicial disability due to symptoms of CHF.

Class 1:

Patients with cardiac disease but without resulting limitations of physical activity. Ordinary physical activity does not cause undue fatigue, palpitations, or dyspnea.

Class 2:
Patients with cardiac disease that results in slight limitation of physical activity. They are comfortable at rest. Ordinary physical activity results in fatigue, palpitations, or dyspnea. Ordinary physical activity includes walking more than 2 blocks on level ground, climbing more than 1 flight of stairs at normal pace, walking uphill, walking or climbing stairs rapidly, walking or stair climbing under adverse conditions (cold, wind, emotional stress).

Class 3:
Patients with cardiac disease that results in marked limitation of physical activity. They are comfortable at rest. Less than ordinary activity causes fatigue, palpitations, or dyspnea. Less than normal activity includes walking 1 to 2 blocks on level ground or climbing 1 flight of stairs at a normal pace.

Class 4:
Patients with cardiac disease that results in inability to carry out any physical activity without symptoms of fatigue, palpitations or dyspnea. Symptoms may be present even at rest. If any physical activity is undertaken, symptoms are increased.

DEFINITION OF DISTAL DISEASE

1= Normal

2= Minimal:
Diffuse intimal thickening or mild plaque formation.

3= Moderate:
Diffuse intimal thickening or plaque formation with some luminal compromise.

4= Severe:
Diffuse intimal or plaque fomation with significant luminal compromise.

DEFINITION OF EXCERCISE STRESS TESTING

Very Positive Stress ECG:
(a) During the first three minutes of the test (or onset at rate less than 120 beats/minute off beta-blockers, or less than 6.5 METS) the patient develops: (1) 1mm or more of horizontal or downsloping ST segment depression that present 80msec after the J-point or (2) the occurence of typical angina; OR (b) a decrease in systolic blood pressure of 20mm mercury or more; OR (c) more than 2mm of horizontal or downsloping ST depression at any time; OR (d) persistence of ST depression for greater than six minutes post-exercise.

Postive Stress ECG:
After the first three minutes of the test the patient develops: (a) 1mm or more of horizontal or downsloping ST segment depression that is present 80msec after the J-point OR (b) typical angina occurs.

Indeterminate or Negative Stress ECG:
Absence of any of the above findings.

DEFINITION OF THE URGENCY OF REVASCULARIZATION PROCEDURES

Elective:
Patient is undergoing CABG on an elective basis. The patient is clinically stable, and his/her overall medical condition does not require revascularization within 7 days.

Urgent:
Patient is undergoing CABG on an urgent basis. The patient may be unstable, have disease that warrants revascularization within 7 days, or the patient is stable but has suffered a complication or event within the past 14 days that substantially increases the risk of revascularization (e.g., myocardial infarction).

Emergent:
Patient is undergoing CABG on an emergent basis. The patient is unstable clinically, and his/her condition requires immediate revascularization (revascularization must occur within 24 hours).

DEFINITION OF "SHED BLOOD"

Intraoperative salvaging of patients own blood volume through a packing and washing process. Exudate is removed and the pure RBC content is then reinfused into the patient.

CLINICAL DATABASE ON CABG PATIENTS

HOSPITAL ID: __ __ 1-2

PATIENT ID: __ __ __ __ 3-6

SECTION A. PATIENT DEMOGRAPHICS

A-1) Name

Last: _____ 7-21

First: _____ 22-36

M.I.: __ 37

A-2) SSN: __ __ __ / __ __ / __ __ __ __ 38-46

A-3) Home Address

City: _____ 47-61

State: __ __ 62-63

Zip: __ __ __ __ __ 64-68

A-4) Birth Date (MM/DD/YY): __ __ / __ __ / __ __ 69-74

A-5) Sex (CIRCLE ONE) 75

Male 1
Female 2

A-6) Race (CIRCLE ONE) 76

Caucasian 1
Black 2
Hispanic 3
Asian 4
Native American 5
Other 6

SECTION B. CABG HOSPITALIZATION

B-1) Key Dates

Admission Date (MM/DD/YY): __ __ / __ __ / __ __ 77-82

Date of Coronary Angiography: (if applicable) __ __ / __ __ / __ __ 83-88

Date of PCTA: (if applicable) __ __ / __ __ / __ __ 89-94

Date of CABG: __ __ / __ __ / __ __ 95-100

Discharge Date: __ __ / __ __ / __ __ 101-106

B-2) Discharge Diagnoses

DRG: __ __ __ 107-109

Principal diagnosis:

	ICD9 Code (if available)	
_____	__ __ __ __ __	110-114
_____		

B-3) Referring Physician

Name

Last: _____ 115-129

First: _____ 130-144

Practice Address

City: _____ 145-159

State: __ __ 160-161

Zip Code: __ __ __ __ __ 162-166

Specialty (CIRCLE ONE) 167

Cardiologist 1
Primary Care Physician 2
Other 3

(PLEASE SPECIFY) _____

_____ __ __ 168-169

Date of

B-4) Name of Principal CABG Surgeon

Last: _____ 170-184

First: _____ 185-199

SECTION C. CLINICAL HISTORY

C-1) Clinical Presentation for CABG Hospitalization (See Glossary) (CIRCLE ONE) — 200

- Assymptomatic CAD off medications 1
- Stable Angina 2
- Unstable Angina 3
- Acute Myocardial Infarction 4
- Don't know 8

C-2) If patient presented with stable angina, please indicate the Canadian Heart Association Class: (See Glossary) (CIRCLE ONE) — 201

- Class 1 1
- Class 2 2
- Class 3 3
- Class 4 4
- Don't know 8

C-3) If patient was admitted with an acute MI, time from onset of MI to date of CABG surgery: (CIRCLE ONE) — 202

- < 7 days 1
- 8 - 14 days 2
- > 14 days 3
- Don't know 8

C-4) Type of cardiac medications at time of admission (CIRCLE ALL THAT APPLY)

- ACE Inhibitors ..... 1 — 203
- Antiarrhythmics ..... 1 — 204
- Anticoagulants ..... 1 — 205
- Aspirin ..... 1 — 206
- Beta Blockers ..... 1 — 207
- Calcium antagonists ..... 1 — 208
- Digitalis ..... 1 — 209
- Diuretics ..... 1 — 210
- Inotropic agents ..... 1 — 211
- Lipid-lowering agents ..... 1 — 212
- Long-acting nitrates ..... 1 — 213
- Persantine ..... 1 — 214
- Short acting nitrates ..... 1 — 215
- Vasodilators ..... 1 — 216
- Don't know ..... 1 — 217
- Other ..... 1 — 218

(PLEASE SPECIFY) _____

_____ _ _ 219-220

CARDIAC HISTORY

C-5) Previous myocardial infarctions: i.e. other than an acute MI responsible for this admission (CIRCLE ONE) — 221

- None 1
- One MI 2
- Two MIs 3
- > Two MIs 4
- Don't know 8

C-6) If C-5 is YES, please indicate length of time from this most recent MI to date of CABG (CIRCLE ONE) — 222

- <= 15 days 1
- 16 - 30 days 2
- 31 - 60 days 3
- > 60 days 4
- Don't know 8

< 7
8 - 14
15 - 30
31 - 60

C-7) History of congestive heart failure (CIRCLE ONE) — 223

- Yes 1
- No 2
- Don't know 8

C-8) If C-7 is YES, please indicate the Canadian Heart Association Class (See Glossary) — 224

- Class 1 1
- Class 2 2
- Class 3 3
- Class 4 4
- Don't know 8

C-9) Previous episode of cardiac arrest (CIRCLE ONE) — 225

- Yes 1
- No 2
- Don't know 8

PREVIOUS CARDIAC PROCEDURES

C-10) Previous CABG (CIRCLE ONE) — 226

- Yes 1
- No 2
- Don't know 8

IF C-10 IS YES, PLEASE PROVIDE DATES, OTHERWISE GO TO C-12

C-11) Most recent previous CABG (YY): _ _ 227-228

Next most recent: _ _ 229-230

Third most recent: _ _ 231-232

C-12) Previous PTCA (CIRCLE ONE)

Yes	1	
No	2	233
Don't know	8	

IF C-12 IS YES, PLEASE PROVIDE DATES, OTHERWISE GO TO C-14

C-13) Most recent PTCA (MM/YY): __ __ / __ __ 234-237

Next most recent: __ __ / __ __ 238-241

Third most recent: __ __ / __ __ 242-245

C-14) Valve replacement or repair (CIRCLE ONE)

Yes	1	
No	2	246
Don't know	8	

C-15) If C-14 is YES, please indicate valve(s) repaired or replaced (CIRCLE ALL THAT APPLY)

Mitral	1	247
Aortic	1	248
Pulmonic	1	249
Tricuspid	1	250

C-16) Other previous cardiac procedures (CIRCLE ONE)

Yes	1	
No	2	251
Don't know	8	

C-17) If C-16 is YES, please indicate which procedures (CIRCLE ALL THAT APPLY)

LV aneurysm	1	252
VSD	1	253
ASD	1	254
Cardiac trauma	1	255
Pacemaker	1	256
AICD	1	257
Other	1	258

(PLEASE SPECIFY) _____

_____ __ 259-260

C-18) Other vascular procedures (CIRCLE ONE)

Yes	1	
No	2	261
Don't know	8	

C-19) If C-18 is YES, please indicate which procedures (CIRCLE ALL THAT APPLY)

Aortic aneurysm	1	262
Carotid endarterectomy	1	263
Peripheral vascular	1	264
Other	1	265

(PLEASE SPECIFY) _____

_____ __ 266-267

COMORBID CONDITIONS

C-20) Previous stroke or TIA (CIRCLE ONE)

Yes	1	
No	2	268
Don't know	8	

C-21) Peripheral vascular disease (CIRCLE ONE)

Yes	1	
No	2	269
Don't know	8	

C-22) COPD on medications (CIRCLE ONE)

Yes	1	
No	2	270
Don't know	8	

C-23) Diabetes (CIRCLE ONE)

Yes	1	
No	2	271
Don't know	8	

C-24) If C-23 is YES, indicate medication(s) for diabetes (CIRCLE ONE)

Insulin	1	
Oral hypoglycemic	2	272
No medication	3	
Don't know	8	

C-25) Hypertension (CIRCLE ONE)

Yes	1	
No	2	273
Don't know	8	

C-26) If C-25 is YES, is patient taking medication for hypertension? (CIRCLE ONE)

Yes	1	
No	2	274
Don't know	8	

C-27) Chronic renal insufficiency (creatinine > 2 mg%) (CIRCLE ONE)

Yes	1	
No	2	275
Don't know	8	

C-28) If C-27 is YES, is patient on dialysis (CIRCLE ONE)

Yes	1	276
No	2	
Don't know	8	

C-29) Malignancy (CIRCLE ONE)

Yes	1	277
No	2	
Don't know	8	

C-30) If C29 is YES, please specify site of malignancy

Site :_____ _ _ 278-279

RISK FACTORS

C-31) Smoking history (CIRCLE ONE)

Never	1	280
Stopped	2	
Current	3	
Don't know	8	

SECTION D. PHYSICAL EXAMINATION CLOSEST TO CABG SURGERY

D-1) Height (FEET/INCHES): _ / _ _ 281-283

D-2) Weight (kg): _ _ _ 284-286

D-3) Blood pressure (mmHg): _ _ _ / _ _ _ 287-292

SECTION E. CARDIAC CATHETERIZATION DATA

E-1) Date of most recent catheterization or coronary angiography if not performed during CABG hospitalization (MM/YY): _ _ / _ _ 293-296

E-2) Hospital where procedure performed

Name: _____ 297-316

City: _____ 317-331

State: _ _ 332-333

E-3) Left ventricular ejection fraction (%) _ _ 334-335

E-4) Methods by which LVEF measured (CIRCLE ONE)

LV gram , estimated	1	336
LV gram, calculated	2	
Radionuclide, estimated	3	
Radionuclide, calculated	4	
Echocardiogram	5	
Not available	6	
Other	7	

(PLEASE SPECIFY) _____

_____ _ _ 337-338

CORONARY ARTERY DISEASE ANATOMY

E-5) Please indicate the maximum percent stenosis for diseased coronary artery segments. Be as specific as possible in indicating the location of obstructions.

Coronary Artery Segment	Maximum % Stenosis	
Right Coronary Artery		
Prox RCA	_ _	339-340
Mid RCA	_ _	341-342
Dist RCA	_ _	343-344
Branches off RCA		
PDA	_ _	345-346
Posterior-lateral	_ _	347-348
Left Coronary Artery		
LMCA	_ _	349-350
Prox LAD	_ _	351-352
Mid LAD	_ _	353-354
Dist LAD	_ _	355-356
Diagonal 1	_ _	357-358
Daigonal 2	_ _	359-360
CX	_ _	361-362
Obtuse Marginal 1	_ _	363-364
Obtuse Marginal 2	_ _	365-366
Obtuse Marginal 3	_ _	367-368

E-6) Method used to estimate degree of coronary artery stenosis (CIRCLE ONE)

Calipers	1	369
Edge technique	2	
Eyeball	3	
Don't know	4	
Other	5	

(PLEASE SPECIFY) _____

_____ _ _ 370-371

E-7) Any existing grafts? (CIRCLE ONE)

Yes	1	372
No	2	
Don't know	8	

SECTION F. PRE-OPERATIVE NON-INVASIVE TEST DATA:

RECORD ONLY RESULTS OF TESTS PERFORMED WITHIN TWO MONTHS OF CABG SURGERY. IF A TEST HAS BEEN PERFORMED MORE THAN ONCE WITHIN THIS PERIOD, RECORD RESULTS OF MOST RECENT TEST

F-1) Cardiac Rhythm (CIRCLE ALL THAT APPLY)

NSR	1	373
A Fib	1	374
SVT	1	375
First degree AV block	1	376
Second degree AV block	1	377
Complete AV block	1	378
PVCs > 10/minute	1	379
Episodes VT (runs of 3 or more PVCs)	1	380
Don't know	1	381

F-2) Evidence of carotid disease by ultrasound or angiography (CIRCLE ONE)

Yes - symptomatic	1	382
Yes - asymptomatic	2	
No	3	
Don't know	8	

F-3) ETT (See Glossary for definitions) (CIRCLE ONE)

Normal or minimally positive	1	383
Strongly positive	2	
Don't know	8	

F-4) Exercise or stress thallium shows ischemia-redistribution (CIRCLE ONE)

Yes	1	384
No	2	
Don't know	8	

F-5) Exercise gated blood pool shows fall in EF or new wall motion abnormalities (CIRCLE ONE)

Yes	1	385
No	2	
Don't know	8	

SECTION G. PRE-OPERATIVE CABG SURGERY RISK ASSESSMENT

G-1) Revascularization priority (See Glossary) (CIRCLE ONE)

Elective	1	386
Urgent	2	
Emergent	3	

G-2) Patient origin (CIRCLE ONE)

Ward	1	387
CCU	2	
Cath lab	3	
Other	4	

(PLEASE SPECIFY) _____

_____ _ _ 388-389

G-3) Anginal status at time of CABG surgery (See Glossary) (CIRCLE ONE)

Stable	1	390
Unstable	2	
Acute event	3	

G-4) Pre-operative use of IABP (CIRCLE ONE)

Yes	1	391
No	2	
Don't know	8	

G-5) Pre-operative use of thrombolytic agents (CIRCLE ONE)

Yes	1	392
No	2	
Don't know	8	

IF G-5 IS YES, PLEASE ANSWER QUESTIONS G-6 THRU G-8, OTHERWISE GO TO SECTION H

G-6) Thrombolytic agent used (CIRCLE ONE)

PTA	1	393
SK	2	
Other	3	

(PLEASE SPECIFY) _____

_____ _ _ 394-395

G-7) Time between use of thrombolytic agent and CABG (CIRCLE ONE)

Less than 6 hours	1	
7 - 24 hours	2	
25 - 48 hours	3	396
More than 48 hours	4	
Dont't know	8	

G-8) Hematocrit immediately prior to CABG surgery (%) ..... _ _ 397-398

SECTION H. OPERATIVE DATA

H-1) CABG Procedure (CIRCLE ONE)

First CABG	1	
Redo	2	399

H-2) Non-cardiac procedures performed (CIRCLE ALL THAT APPLY)

Aortic aneurysm	1	400
Cartoid endarterectomy	1	401
Other	1	402

(PLEASE SPECIFY) _____

_____ _ _ 403-404

H-3) Primary anesthetic technique (CIRCLE ONE)

Opioid / narcotic	1	
Inhalation	2	405
Combination	3	
Other	4	

(PLEASE SPECIFY) _____

_____ _ _ 406-407

H-4) Types of myocardial protection (CIRCLE ALL THAT APPLY)

Intermittent cross-clamp	1	408
Crystalloid cardoplegia	1	409
Blood cariopl(egia	1	410
Continuous perfusion / no cross clamp	1	411
Retrograde perfusion	1	412
Topical hypothermia	1	413
Other	1	414

(PLEASE SPECIFY) _____

_____ _ _ 415-416

H-5) Intra-op insertion of IABP (CIRCLE ONE)

Yes	1	
No	2	417
Don't know	8	

H-6) If H-6 is YES, please specify indication for IABP

_____

_____ _ _ 418-419

H-7) Intra-op insertion of VAD (CIRCLE ONE)

Yes	1	
No	2	420
Don't know	8	

H-8) If H-7 is YES, type of VAD (CIRCLE ONE)

LVAD	1	
RVAD	2	
BVAD	3	421
TAH	4	

H-9) Pacing required (CIRCLE ONE)

Yes	1	
No	2	422
Don't know	8	

H-10) If H-10 is YES, please specify type of pacing (CIRCLE ONE)

Atrial , temporary	1	
Atrial, permanent	2	
Ventricular, temporary	3	423
Ventricular, permanent	4	
Other	5	

(PLEASE SPECIFY) _____

_____ _ _ 424-425

H-11) Operative times (MINUTES)

Cross-clamp time:	_ _ _	426-428
Perfusion time:	_ _ _	429-431
Total anethesia time:	_ _ _	432-434

H-12) Intraoperative use of blood bank products in units

Whole blood:	_ _	435-436
RBCs:	_ _	437-438
FFP:	_ _	439-440
Cryo:	_ _	441-442
Platelets:	_ _	443-444

H-13) Shed blood used (See Glossary) (CIRCLE ONE)

Yes	1	
No	2	445
Don't know	8	

H-14) Condition of patient on leaving OR (CIRCLE ONE)

Alive	1	
Dead	2	446

CORONARY ARTERY BYPASS GRAFTS

H-15) Please complete the table for all bypass grafts and endarterectomies, USING KEY BELOW

Distal Disease:	Conduit:
1 = None	1 = SV
2 = Minimal	2 = LIMA
3 = Moderate	3 = RIMA
4 = Severe	4 = Free- LIMA
	5 = Free- RIMA
	6= GEPA
	7= Free GEPA
	8= Other

BYPASS GRAFT TABLE

Artery Segment Receiving Grafts	Distal Disease	Conduit	Endart (Y/N)	
RCA:				
Prox RCA	_	_	_	447-449
Mid RCA	_	_	_	450-452
Dist RCA	_	_	_	453-455
Branches off RCA:				
PDA	_	_	_	456-458
Posterior-lateral	_	_	_	459-461
LCA:				
Prox LAD	_	_	_	462-464
Mid LAD	_	_	_	465-467
Dist LAD	_	_	_	468-470
Diagonal 1	_	_	_	471-473
Diagonal 2	_	_	_	474-476
CX	_	_	_	477-479
Obtuse Marginal 1	_	_	_	480-482
Obtuse Marginal 2	_	_	_	483-485
Obtuse Marginal 3	_	_	_	486-488

H-16) Were any intended coronary artery lesions not bypassed? (CIRCLE ONE)

Yes	1	
No	2	489
Don't know	8	

H-17) If H-16 is YES, circle all lesions not bypassed (CIRCLE ALL THAT APPLY)

Coronary Artery Segment:		
Right Coronary Artery		
Prox RCA	1	490
Mid RCA	1	491
Dist RCA	1	492
Branches off RCA		
PDA	1	493
Posterior-lateral	1	494
Left Coronary Artery		
LMCA	1	495
Prox LAD	1	496
Mid LAD	1	497
Dist LAD	1	498
Diagonal 1	1	599
Diagonal 2	1	500
CX	1	501
Obtuse Marginal 1	1	502
Obtuse Marginal 2	1	503
Obtuse Marginal 3	1	504

SECTION I. POSTOPERATIVE COURSE

I-1) Postoperative pharmacological or mechanical support (CIRCLE ALL THAT APPLY)

High dose inotropic agents > 12 hours	1	505
New permanent pacemaker	1	506
LVAD	1	507
RVAD	1	508
IABP	1	509
Ventilator > 48 hours	1	510

I-2) Use of blood bank products during the first 72 hours p.o. (CIRCLE ONE)

Yes	1	
No	2	511
Don't know	8	

I-3) If I-2 is YES, please specify amounts in units

Whole blood:	__ __	512-513
RBCs:	__ __	514-515
FFP:	__ __	516-517
Cryo:	__ __	518-519
Platelets:	__ __	520-521

POSTOPERATIVE COMPLICATIONS

I-4) Did patient suffer any postoperative complications? (CIRCLE ONE)

Yes	1	
No	2	522
Don't know	8	

IF I-4 IS YES, PLEASE ANSWER QUESTION I-5 THRU I-20, OTHERWISE SKIP TO SECTION J

I-5) Reoperation (CIRCLE ONE)

Yes	1	
No	2	523
Don't know	8	

I-6) If I-5 is YES, reason for reoperation (CIRCLE ONE)

Bleeding	1	
Graft occlusion	2	524
Other cardiac	3	

(PLEASE SPECIFY) _____

_____

Other non-cardiac	4	

(PLEASE SPECIFY) _____

_____ __ 525-526

I-7) Post-op MI presenting new Q-waves (CIRCLE ONE)

Yes	1	
No	2	527
Don't know	8	

I-8) Infection (CIRCLE ONE)

Yes	1	
No	2	528
Don't know	8	

I-9) If I-8 is YES, please specify (CIRCLE ALL THAT APPLY)

Sternum-superficial	1	529
Sternum-deep	1	530
Leg	1	531
IABP site	1	532
Septicemia	1	533
Other	1	534

(PLEASE SPECIFY) _____

_____ __ 535-536

I-10) Neurologic complications (CIRCLE ONE)

Yes, intra-op	1	
Yes, post-op	2	537
No	3	
Don't know	8	

I-11) If I-10 is YES, indicate type of neurologic complication (CIRCLE ONE)

Stroke-permanent	1	
Stroke-transient	2	538
Coma	3	
Other	4	

(PLEASE SPECIFY) _____

_____ _ _ 539-540

I-12) Pulmonary complications (CIRCLE ONE)

Yes	1	
No	2	541
Don't know	8	

I-13) If I-12 is YES, please indicate type of pulmonary complication (CIRCLE ALL THAT APPLY)

Pulmonary embolism	1	542
Pneumonia	1	543
Other	1	544

(PLEASE SPECIFY) _____

_____ _ _ 545-546

I-14) Renal failure requiring dialysis (CIRCLE ONE)

Yes	1	
No	2	547
Don't know	8	

I-15) Vascular complications (CIRCLE ONE)

Yes	1	
No	2	548
Don't know	8	

I-16) If I-15 is YES, please indicate type of vascular complication (CIRCLE ONE)

Aortic dissection	1	
Iliac / femoral dissection	2	549
Arterial embolus requiring treatment	3	
Other	4	

(PLEASE SPECIFY) _____

_____ _ _ 550-551

I-17) Other complications (CIRCLE ALL THAT APPLY)

Heart block requiring permanent pacemaker	1	552
Cardiac arrest	1	553
Anticoagulant complication	1	554
Tamponade	1	555
GI complications	1	556
Multi-system failure	1	557
Other	1	558

(PLEASE SPECIFY) _____

_____ _ _ 559-560

I-18) Died (CIRCLE ONE)

Yes	1	561
No	2	

IF I-18 IS YES, PLEASE ANSWER QUESTION I-19 AND I-20, OTHERWISE SKIP TO SECTION J

I-19) Date of Death (MM/DD/YY): _ _ / _ _ / _ _ 562-567

I-20) Cause of Death (CIRCLE ONE)

Cardiac	1	
Infection	2	
Neurologic	3	568
Pulmonary	4	
Renal	5	
Don't know	6	
Other	7	

(PLEASE SPECIFY) _____

_____ _ _ 569-570

SECTION J. DISPOSITION AT TIME OF HOSPITAL DISCHARGE

J-1) Discharge medications (CIRCLE ALL THAT APPLY)

ACE Inhibitors	1	571
Antiarrhythmics	1	572
Anticoagulants	1	573
Aspirin	1	574
Beta Blockers	1	575
Calcium antagonists	1	576
Digitalis	1	577
Diuretics	1	578
Inotropic agents	1	579
Lipid-lowering agents	1	580
Long-acting nitrates	1	581
Persantine	1	582
Short acting nitrates	1	583
Vasodilators	1	584
Don't know	1	585
Other	1	586

(PLEASE SPECIFY) _____

_____ _ _ 587-588

J-2) Discharge destination (CIRCLE ONE)

Home with family	1	
Home with Home Health Care	2	
Rehabilitation Facility	3	589
Skilled Nursing Facility	4	
Other	5	

(PLEASE SPECIFY) _____

_____ _ _ 590-591

Appendix E

Case Study Interview Protocols

ORGANIZATIONAL EFFICIENCIES

This part of the interview protocol includes questions that measure the extent of organizational change, either as a result of the demonstration or more basic changes taking place in the medical care marketplace. These questions are generic in the sense that they apply to many departments, including nursing, operating rooms, ICU, catheter lab, and the pharmacy. Slight changes in the wording will make them department-specific when interviewing in a given department. These questions will be asked of each department head separately as well as of the Vice-President for Patients Services, the UR coordinator, and the demo manager.

Overview of Department

1. What department are you responsible for?

2. In general, what kinds of services do bypass patients receive in this department?

3. In the last 2-3 years, what changes have taken place in the way the department in general has been organized and managed? New staffing? Equipment? Inventorying?

4. Have you or your staff conducted any studies of patient flow-through? Results?

5. Do you know of any studies of the time your staff spends with patients? If so, what changes have occurred in labor productivity in your department?

Patient Management

6. As a result of the demonstration, has the hospital instituted any changes in patient management in your department? Internal utilization review? Triaging to less intensive nursing?

7. Has there been any recent changes in the kinds of supplies, drugs, etc. that have been ordered for bypass patients?

8. Patient complications add significantly to costs. What has your department or hospital administration done to avoid complications? How successful have these efforts been? Any evidence?

9. Across departments, have any changes been made in the way bypass patients are sequenced through the hospital? Same day admit? Shorter ICU stays? Stepdown units?

10. Have you noticed any efficiency gains in your department from having the physician staff under the same fixed payment?

11. Are you aware of formal meetings with physicians and your staff that address issues of efficiency and costs?

Drug Utilization

12. Drugs are a major cost of bypass surgery. What are the major kinds of drugs used in bypass surgery and what are they used for?

13. Has the hospital, physicians, or pharmacists conducted any drug utilization studies specific to bypass patients? If so, what was found?

14. Does the hospital have a formulary for heart bypass drugs? Has the hospital reconsidered therapeutic substitutes recently?

15. Has the hospital changed its purchasing arrangements for these or other drugs recently? Have you negotiated larger discounts on certain drugs?

Volume and Severity Effects

16. In the last 2-3 years, have there been any increases or decreases in volume in your department? If so, how much?

17. What is the current utilization rate in your department? How many more bypass patients could be accommodated?

18. Any changes in patient severity? Do you have any measures of severity?

19. How have you responded to volume changes? Added more staff? Expanded beds? New lab facilities? OR suites?

20. If volume has increased, do you think it has allowed you to use your staff more efficiently or have you had to take on staff at a premium or add expensive new beds and equipment?

21. Are you currently facing constraints in expanding bypass volume in your department? If so, what are the constraints?

Future Improvements

22. Where do you feel that savings can be the greatest through changes in either your department or the way bypass patients are treated?

QUESTIONS ON PHYSICIAN PARTICIPATION AND REIMBURSEMENT UNDER THE DEMONSTRATION

This group of questions, to be administered separately to the Director of the Heart Institute, the bid coordinator, a thoracic surgeon, and the manager of the demonstration, concern the physicians' decision to participate in the demo and the way in which they are reimbursed.

Physician Involvement in the Decision to Bid

1. How interested were the various physician specialties in participating in the HCFA demonstration?

2. Which physicians worked actively in writing the initial bid and responding to the follow-up questions and negotiations?

3. What kinds of reimbursement information were provided to the hospital by physicians in determining the initial hospital bid? Did the information differ by specialty? How accurate was this information? How did it compare to HCFA's estimates of physician payments?

4. Was the new RBRVS system ever mentioned as a reason for physicians to participate?

5. What was the nature of the discussions with physicians on how much of a discount to offer HCFA initially? Discussions on revising the physician discount in a best-and-final bid?

6. How was the final division of the single payment between the hospital and the medical staff arrived at? Did the decision process or discounts differ by specialty? If so, how?

7. Please describe the administrative arrangements that were put in place for disbursing the single payment received from HCFA. Was there consideration of setting up a legal joint entity to receive payments?

8. Does the physician staff share in any bonuses or are there any withholds in interim physician payments? If so, how were they determined?

9. If the hospital now has other single-payment contracts, how do the billing, payment, and disbursement arrangements differ from the HCFA demonstration?

10. Have all the physician groups been satisfied with the level and efficiency of disbursements under the demonstration? If not, have any groups requested changes in the system or payment schemes?

11. Is there any sharing with physicians of hospital profits resulting from greater volumes or changes in patient care that lower hospital costs?

12. How do the hospital and physician groups monitor utilization in order to avoid financial losses? What joint monitoring arrangements exist between the hospital and physicians?

INTERVIEW PROTOCOL FOR
MICRO-COST ANALYSTS

The purpose of this questionnaire is to ascertain the kinds of micro-cost analyses being conducted by demo hospitals to track the costs of demo patients. Having offered discounts and accepted more risk for outlier cases, we are interested in the ways in which hospitals and physicians are monitoring utilization and costs.

1. Please describe the patient-level costing system the hospital uses to track bypass patients. Place particular emphasis on the degree of detail with regard to services provided, e.g., ICU nursing days, CAT scans, quantities of specific drugs.

2. Please provide a set of example reports that are used to monitor the costs and utilization of demo patients.

3. What do you consider the strengths and weaknesses of your present monitoring system?

4. How has management used the monitoring reports to reduce the costs of demo or other bypass patients?

5. How good is your system in reflecting differences in patient severity and needs when evaluating costs?

6. Does the system stratify patient costs by attending physician or surgeon?

7. Has management talked with department managers about improving efficiency in treating bypass patients? Please elaborate.

8. Has management talked with individual physicians or specialty groups about improving patient flow-through, resource use, etc.? If so, how have your monitoring reports been used in these discussions?

9. To what extent does your monitoring system reflect lower costs due to increases in overall volume? Please consider the way your system treats fixed and variable costs.

10. How does management interpret reports showing losses on individual patients? Are individual patients ever the focus of consideration or is it always a group of patients? If a group, what grouping logic is used?

11. Does management regard differences between charges and allocated costs as a loss, or between payments and costs?

12. If the payment rate negotiated with HCFA covers variable, or direct, costs, and some but not all of fixed costs, how is this viewed by management?

13. How often does reimbursement for a Medicare bypass patient fail to cover average total cost? Average variable costs?

14. Does administration consider the spillover effects of greater bypass volume on other hospital admissions and departmental costs?

15. Is the hospital willing to accept accounting losses on Medicare bypass patients? If yes, why? If no, what has administration been doing to reduce losses?

16. Do you know if your monitoring reports have been used to develop other bids on packaged services for privately insured patients, either for bypass or other kinds of patients?

INTERVIEW PROTOCOL FOR
CEO AND OTHER ADMINISTRATORS
IN COMPETING LOCAL HOSPITALS

This questionnaire is to be used in interviewing the CEO, CFO, and other administrative staff in one or two hospitals performing bypass surgery in the same market as a Medicare Bypass Demonstration hospital. The purposes of the interviews are to determine (1) the impact of the demo hospital's bypass designation on local competitors, (2) the competitive reactions of local hospitals, and (3) the decision by other local hospitals to bid or not to bid to become a HCFA demonstration hospital.

Impact on Local Hospitals

1. How would you characterize the level of overall competition for cardiac surgery in your market? Who are the key providers? Who are the leaders and who are trying to gain a foothold in the market?

2. Has the cardiac surgery market become more competitive in the last 5 years? How so? Which hospitals seem to be gaining market share?

3. Do you consider the heart bypass market locally to be growing, mature and stable, or declining? If stable or declining, how has this affected your marketing efforts?

4. Where does your hospital fit into the local market? Is cardiac surgery a special emphasis of your hospital? Within heart surgery, is bypass surgery emphasized?

5. Are your aware that (fill in demonstration hospital) was designated a Medicare Hospital Bypass Hospital in 1991? How did you find out?

6. Do you know if (demo hospital) has gained volume and market share in the last couple of years? Do you know what has happened to your own market share during this period?

7. How would you characterize the nature of competition between your hospital and (demo hospital)? Strong and direct? Remote? No different than several other hospitals in the market?

8. How would you characterize the quality of care in (demo hospital) for bypass surgery? Best in the city? Similar to your own?

9. Are there local hospitals performing bypass surgery that, in your opinion, shouldn't be?

10. What criteria do you and referring physicians use to rate quality of bypass surgery across hospitals?

11. Are you aware of any changes in the way (demo hospital) is marketing its cardiac surgery program? Examples? What efforts are specific to bypass surgery?

12. How effective do you regard the marketing efforts of (demo hospital) for its bypass surgery program?

Competitive Reactions

13. Did your hospital and physician staffs have any concerns about (demo hospital) being designated a Medicare Heart Bypass Center? If so, what were your concerns?

14. What kinds of advertising or other marketing does your hospital support that is specific to cardiac surgery in general and bypass surgery in particular?

15. Are you aware of any other hospitals being concerned about (demo hospital) being designated a Medicare Bypass Center?

16. Has your hospital negotiated any bundled single payment contracts for heart surgery with private or public insurers or employers? If so, were these packages developed in response to the (demo hospital)? Or were you approached by private insurers/employers to provide a bundled rate for heart surgery similar to Medicare's bypass package?

17. Have you been asked to join a network of hospitals and physician groups providing a bundled package of heart services to insurers or employers? If yes, how has the arrangement worked out?

Decision to Participate in the Medicare Bypass Demonstration

18. Did you consider applying to HCFA to become a heart bypass center? Why or why not?

19. What role did physicians play in your deciding to apply or not?

20. Were you aware that (demo hospital) was submitting a bid?

21. In order to submit a bid, what kinds of information would you need to collect? Would this be a significant obstacle to your applying to be a center?

22. What do you consider to be the strengths and weaknesses of a single bundled payment covering both hospital and physician services for bypass surgery?

23. Would you submit an application to be a HCFA bypass center today?

Questions for hospitals that did apply

24. What were your impressions of the HCFA review process in choosing the bypass demonstration hospitals? Fairness? Opportunities to resubmit a better bid? Relevance of review criteria?

25. Would you submit a new bid to HCFA to become a bypass center if invited? If not, why? Lack of impact on market share? Administrative burden? Physician resistance?

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5. What was the nature of the discussions with physicians on how much of a discount to offer HCFA initially? Discussions on revising the physician discount in a best-and-final bid?

6. How was the final division of the single payment between the hospital and the medical staff arrived at? Did the decision process or discounts differ by specialty? If so, how?

7. Please describe the administrative arrangements that were put in place for disbursing the single payment received from HCFA. Was there consideration of setting up a legal joint entity to receive payments?

8. Does the physician staff share in any bonuses or are there any withholds in interim physician payments? If so, how were they determined?

9. If the hospital now has other single-payment contracts, how do the billing, payment, and disbursement arrangements differ from the HCFA demonstration?

10. Have all the physician groups been satisfied with the level and efficiency of disbursements under the demonstration? If not, have any groups requested changes in the system or payment schemes?

11. Is there any sharing with physicians of hospital profits resulting from greater volumes or changes in patient care that lower hospital costs?

12. How do the hospital and physician groups monitor utilization in order to avoid financial losses? What joint monitoring arrangements exist between the hospital and physicians?

INTERVIEW PROTOCOL:
ADMINISTRATIVE COSTS

This protocol includes a set of generic questions on the administrative costs associated with becoming a Medicare Heart Bypass Center then implementing and running the demonstration. These questions will be asked separately of the following persons: (1) CFO; (2) Director of the Heart Institute; (3) the person responsible for putting the original bid together; (4) the manager of the demonstration; and (5) the Director of Marketing. The Data Collection Design report that was sent to the four original sites included a general form to be used to estimate labor time across 5 administrative tasks related to the on-going management of the demonstration: (1) billing/accounting; (2) marketing; (3) quality assurance; (4) HCFA reporting; and (5) General administration. This protocol includes, first, a set of specific questions relating to putting the bid together, followed by a second set on the labor and other costs incurred in each of the 5 management areas.

Costs of Putting the Bid Together

1. Please list the various activities that the hospital and physician staffs were engaged in when putting together the initial bid.

2. Can you provide rough estimates of the time involved of various individuals in the major activities related to the bid? Please refer to our Data Collection Protocols.

3. What kinds of statistical work was involved? How much of a burden was the estimation of the cost of bypass patients on the hospital? On physicians?

Costs of On-going Management of the Demonstration

4. What special allocations of personnel have been made to respond to the needs of the demonstration in the areas of billing/accounting, marketing, QA, HCFA reporting, and general administration? Please limit the personnel times to those involved in demo-specific tasks.

5. Has the hospital been monitoring the on-going inputs and costs to managing the demonstration in any way? Please describe.

6. Have these allocations increased or decreased over time? If so, why?

7. What tasks have been particularly burdensome in terms of extra management time? Billing and collection? Reporting?

8. For new hospitals joining the demonstration, what recommendations would you have regarding the administrative structure and personnel inputs necessary to participate in the demonstration?

9. How different would the administrative requirements be if the hospital and physicians were being paid a single rate but not as part of a HCFA demonstration? If you have any similar private contract arrangements, their management requirements might be a good indicator.

10. Do you have any suggestions for improving the way the demonstration is managed by HCFA?

CEO, CFO, AND DEMO MANAGER INTERVIEW PROTOCOL

The primary reasons for interviewing the hospital CEO (and possibly the COO), the manager of the demonstration, and the hospital CFO together is to gather feedback on the reasons for submitting a bid to become a heart bypass center, the goals the hospital has for the demonstration and how they are being accomplished the nature of the interactions with physicians the impact participation has had on the hospital's market and whether the hospital would like to continue in the demonstration and, if not, why.

Reasons for Participating

1. What motivated the hospital to submit an application to become a Medicare Heart Bypass Center? Greater volume? Closer physician relations? Cost control?

2. How important was volume growth in your decision to participate? Were you concerned about maintaining market share?

3. Did the hospital have any concerns about other local hospitals being selected?

4. What were the major difficulties in submitting a bid and how were they overcome?

Goals for the Demonstration

5. Have all the original goals been attained? If not, what obstacles have you encountered?

6. What administrative changes were made in order to achieve the hospital's goals?

Interactions with Physicians

7. What was the proposed organizational arrangement between the hospital and the cardiac surgeons, anesthesiologists, etc. before the demonstration began?

8. Has the relationship changed in any way since the demonstration began?

9. What was the understanding with the physicians about dividing up the single payment if your application was approved?

10. Are all physicians currently satisfied with the payment arrangement? Are any changes in the distribution of payment contemplated?

Impacts on Market

11. Does the hospital have any serious competitors in the cardiac surgery field? If so, who are they? What makes them major competitors?

12. Have new competitors begun performing bypasses since the demonstration started in June of 1991?

13. Are you tracking the number of bypasses in your facility compared to those performed elsewhere in your market?

14. Has the hospital achieved its desired growth in bypass volume? In the volume of other cardiac cases?

15. What actions have competitors taken to counter the hospital's being named a Medicare Bypass Center? How effective do you think these counter-measures have been?

16. What steps has hospital administration taken to increase its market share of bypass surgery?

17. What discussions and programs has administration undertaken jointly with physicians to increase bypass volumes?

18. How active have surgeons and cardiologists been in promoting the hospital? Any examples?

Continuing the Demonstration

19. Is the hospital satisfied with the way the demonstration has gone?

20. Is the hospital considering withdrawing? If so, for what reasons?

21. What are some of the positive outcomes of participating in the demonstration?

QUESTIONS RELATING TO CLINICAL MANAGEMENT AND OUTCOMES

The purposes of these questions are to examine current status of the cardiac surgery program with special emphasis on changes that have occurred during the Medicare Heart Bypass Center Demonstration in past 3 years. Our particular interests are in:

- organizational and management changes
- growth of the cardiac surgery program
- changes in case-mix
- patterns of care
- techniques of coronary angiography, PTCA, or cardiac surgery
- outcomes or utilization management activities
- data systems to monitor the processes or outcomes of cardiac surgery.

Organization and Management

These questions apply to the Heart InstituteDirector/CEO and to the representatives of each clinical department that are interviewed.

1. What changes in organization and mangement strategies have taken place in individual departments involved in CABG surgery (cardiac surgery, cardiology, anesthesiology, nursing, radiology) and in their relationships with one another? How did these changes come about? What were their objectives? What have their effects been on growth, managment efficiencies, quality of patient care, staff morale?

2. What changes have occurred in your physical plant over the past 3 years as they relate to cardiac surgery or cardiology - in OR, ICU, stepdown units, catheterization laboratories, electrophsyiological laboratory, non-invasive laboratories, hospital beds devoted primarily to cardiac patients? What future changes are anticipated?

3. What changes have occurred in the cardiac surgical staff - number of surgeons with privileges, turnover, case volumes (this hospital and total), proportion that are geographic full-time? What were the reasons for these changes? The effects?

4. What changes have occurred in the cardiology staff - numbers of intervential and non-intervential cardiologists, turnover, case volumes of invasive procedures (this hospital and total), proportion that are geographic full-time?

5. What changes have occurred in the relationships between cardiac surgery and cardiology - in referral arrangements, joint decision-making about cases, pre- and post-operative management of the CABG surgery patient? Why did these changes occur? What have been their effects?

6. What changes have occurred in the relationships of cardiac surgery to anesthesiology, radiology, pulmonary medicine, nursing? What were the reasons for these changes and what have been their effects?

7. What steps have been taken to facilitate patient flow-through (e.g. same-day admission, OR scheduling, ICU length of stay, creation of stepdown units, scheduling of laboratory procedures, discharge planning, etc.)? What have the effects been?

8. What other cost control steps have been implemented (e.g. to reduce drug costs, staffing efficiencies, use of consultants, etc)?

9. What steps have been taken to improve monitoring of utilization and outcomes of care hospitalwide and in individual departments? Please describe these monitoring systems and provide examples of how findings have been used to improve efficiency and outcomes of care.

Cardiac Surgery

Volume and Organization

1. What changes have occurred in the volume of CABG surgery over the past 3 years - in Medicare patients; in other patients? Reasons? Changes in referral sources? HMO or employer contracts, etc.?

2. How are CABG surgery cases assigned to members of the surgical staff - direct referral from outside source or cardiology, rotation, subspecialty area (redos, high risk patients, concurrent valve replacement, etc.)? Changes?

3. How are OR time allotments and schedules determined? Changes?

4. Is cardiac surgery organized into teams? What is the composition of a team? Have changes in the organization of teams occurred over the past 3 years?

5. Is a cardiologist involved in the care of each CABG surgical patient or is a cardiologist consulted only on an "as needed" basis? What is the cardiologist's role before, during, after surgery? Has this changed over the past 3 years? What have these changes been? Why were they made? What have the effects been?

6. Do you have cardiac surgical residents or fellows? What are their roles before, during, and after surgery?

7. How does cardiac surgery standby for PTCA work in practice? Has this changed in the past 3 years? Reasons?

Patterns of Care

1. Are same-day admissions scheduled for CABG surgery? If so, for which patients and what proportion of theMedicare and the total case-load? What have been the benefits and problems related to same-day surgery?

2. If you do not schedule same-day admissions, have other steps been taken to shorten pre-operative length of stay? If so, what have these steps been? What have the effects been?

3. How do you define emergent, urgent, elective CABG?

4. Have there been any changes in pre-operative procedures for patients referred for elective CABG surgery (e.g.) diagnostic work-up, preparation of patient for surgery? Is an exercise stress test obtained on all elective CABG surgery patients? Why? Why not?

5. What indications do you use for performing CABG surgery in patients with unstable angina or following an acute MI? Have indications for CABG surgery in these patients changed over the past 3 years? For what reasons?

6. What indications do you use for inserting an IABP preoperatively?

7. What changes in cardiac surgical techniques have occurred over the past 3 years? What have been their effects - on pump time, completeness of revascularization, incidence of post-op complications, outcomes of surgery?

8. What changes in anesthesia techniques have occurred over the past 3 years? What have been their effects?

9. What changes have occurred in the techniques of ICU care? What have been their effects? Who makes the decision when to d/c the respirator and remove the endotracheal tube?

10. Has there been a change in average ICU length of stay? If so, how much, for what reasons, and with what effects?

11. Have there been changes in management strategies after the patient returns to the floor? Earlier mobilization, earlier or more rehabilitation, patient and family education, drug regimens?

12. If patients are being discharged earlier after CABG surgery, what steps have you taken to ensure needed care after the return home - home care, medical follow-up?

13. What are your follow-up procedures - when, how often, by whom?

14. How do you monitor long-term outcomes after CABG surgery? What data so you have on 3, 6, 12 month mortality or angina relief?

Changes in Case-mix

1. What changes have occurred in the clinical risk factor profile of patients undergoing CABG surgery in the past 3 years (e.g. age, sex, extent of coronary artery disease, proportion of redos, left ventricular function, severity of comorbidities)?

2. Has there been an increase in the proportion of emergent or urgent cases? For what reasons?

3. What are the reasons for these changes - role of PTCA, referral patterns, indications for CABG surgery in patients with unstable angina or after AMI?

Cardiology

1. What changes have occurred in the volumes of coronary angiography and PTCA over the past 3 years? What are the major reasons for these changes ?

2. What are your major referral sources for coronary angiography? for PTCA? Have these changed over the past 3 years? For what reasons?

3. What proportion of AMI admissions receive thrombolytic drugs? What proportion receive a coronary angiogram, PTCA, CABG surgery during the AMI admission? What changes have occurred over the past 3 years? Reasons?

4. What proportions of patients with unstable angina receive a coronary angiogram, PTCA, or CABG during their admissions? Changes over the past 3 years?

5. Who interprets the coronary angiogram? Using what measurement technique? Changes over the past 3 years?

6. What proportion of patients who receive a coronary angiogram and have a "significant" stenosis receive a PTCA at the same sitting ? What are the indications for "same day" PTCA? Changes over the past 3 years?

7. When a patient is referred for CABG or PTCA with an angiogram performed elsewhere, who evaluates whether the procedure is adequate to guide the procedure? In what proportion of patients does the angiogram have to be repeated?

8. When a patient is referred to cardiac surgery, what role does the cardiologist play before, during, and after surgery? After discharge? What changes have occurred in the role of the cardiologist over the past 3 years?

9. What changes have occurred in the case-mix of patients receiving PTCA over the past 3 years?

10. What changes in PTCA technique have occurred over the past 3 years? What effects have these had on indications for PTCA, extent of revascularization, outcomes?

Anesthesiology

1. What changes have occurred in organization of anesthesiology vis cardiac surgery over the past 3 years - number of anesthesiologists, case-loads (in hospital, total), turnover, geographic full-time?

2. What changes have occurred in anesthesiology techniques? How have these affected the safety and effectiveness of anesthesiology in cardiac surgery?

3. Are nurse anesthetists involved in cardiac surgery? What are their responsibilities? Has there been any change in the use of nurse anesthetists over the past 3 years?

4. What role does the anesthesiologist play in pre-operative planning? In providing post-operative respiratory care?

5. Do you have a registry to capture intra-operative and post-operative anesthesia complications? How is this registry used to document and improve performance?

6. What patient characteristics increase the complexity of anesthesia? Its risks? Has the case-mix severity increased over the past 3 years? In what respects?

ICU Care - Nursing, Intensivist/Pulmonolgist, Cardiac Surgery

1. Who is primarily responsible for respiratory care of the CABG patient in the ICU? How are responsibilities divided between anesthesiology, respiratory medicine, cardiac surgery, ICU nursing?

2. What changes in ICU staffing and roles/responsibilities have occurred over the past 3 years? What were the reasons for these changes? Their effects?

3. What changes have occurred in ICU practice/technology over the past 3 years? What have been the effects of these changes on patient management and outcomes?

4. Has the length of ICU become shorter? How has this been achieved? With what effects on needs for care and risks of complications after the patient leaves the ICU?

Floor Care - Nursing, Rehabilitation, Discharge Planning

1. What are the major risks after the patient returns to the floor? How are these risks identified and dealt with? Has the case-mix changed over the past 3 years? In what respects? With what effects on care needs?

2. What is the role of rehabilitation? Is a rehabilitation specialist involved? When and with what treatment goals?

3. How is responsibility for medical care divided between the cardiac surgeon and cardiologist?

4. Who are the main participants in discharge planning? Who is in charge? What are the major considerations and guiding principles? Have there been any important changes in the discharge planning process over the past 3 years? What are they? What have been their effects on shortening length of stay and improving post-discharge outcomes?

5. What are the objectives of patient and family education? Who provides this education? How is its success measured?

6. What steps are taken to ensure continuity of care after hospital discharge? How does this differ if the patient lives locally or at a distance? Have there been any changes is efforts to ensure continuity of care over the past 3 year?

Quality and Utilization Management

1. How is the appropriateness of decisions to perform CABG surgery monitored? What criteria do you use? Is assessment done prior to admission or retrospectively? Have any problems been identified? If so, how has your program dealt with them? Have there been any changes in indications for CABG surgery during the past 3 years? What are they? What are their justifications ?

2. What clinical indicators do you monitor routinely (e.g.) operative deaths, reoperations for bleeding, complication rates? Are data on these events collected prospectively or retrospectively? How are profiles examined? What actions have been taken to examine outliers? Please describe an example of a potential quality problem that was identified and how is was evaluated.

3. What process indicators are monitored? Examples might be the interval between referral and admission for elective CABG surgery; interval between the request and performance of coronary angiography in a patient with unstable angina; or the interval between the request for and performance of a non-invasive cardiac test.

4. Is length of stay monitored prospectively or retrospectively? What criteria do you use? If prospective, how is the information used to facilitate timely discharge? If retrospective, how are the data used to influence future decision-making?

5. Is the discharge planning process monitored? How? What types of problems/issues have been identified? How have these been dealt with?

6. Do inefficiencies in patient management result from delays in scheduling tests or procedures, availability of beds in the desired unit, availability of the required physician (cardiac surgeon, cardiologist, anesthesiologist), discharge arrangements? What steps have been taken to correct these? Has the frequency of "administrative" delays in patient care changed over the past 3 years? Please give examples.

7. Are readmissions monitored? With what objectives? What have been the findings?

Clinical Data Collection for the Medicare Heart Bypass Center Demonstration

1. What is the current status of your cardiac surgery registry? Is it based on an existing system or unique to your hospital. Is it fully computerized? How long after discharge is a case entered? By whom? What data sources are used? Do you have a cross-walk with your cardiac catheterization laboratory to enter cath/coronary angiogram results? How is data accuracy validated?

2. What definitions are used in your registry for:

- unstable angina
- AMI
- revascularization priority (emergency, urgent, elective)
- method for measuring percent stenosis of coronary arteries
- method for measuring left ventricular ejection fraction
- postoperative complications such as wound infection, intraoperative MI, stroke
- congestive heart failure

3. How do you ensure consistent use of these definitions?

4. How is the registry used to evaluate and improve your cardiac surgery program?

5. What clinical outcomes do you monitor routinely - operative deaths, surgical complications, readmissions, longer-term outcomes ? What trends have you observed?

6. What case-mix variables are the most important markers of operative deaths, post-operative complications, longer-term survival, angina relief?

Appendix F

Cost Component Expenses by DRG/Patient/Dept/Charge Code

COST COMPONENT EXPENSES BY DRG/PATIENT/DEPT/CHARGE CODE
DATA REQUESTS #4-6 FROM TABLE 1
SAMPLE REPORT

	TOTAL UNITS	DIR FIX SALARY	DIR VAR SALARY	DIR FIX NON-SAL	DIR VAR NON-SAL	DIR FIX CAPITAL	IND FIX SALARY	IND VAR SALARY	IND FIX NON-SAL	IND VAR NON-SAL	IND FIX CAPITAL	TOTAL COSTS	TOT COST PER UNIT
DRG 106 CORONARY BYPASS W/ CAR													
6000072 4 HOURS (O R)	1.00	9.82	212.94	0.51	93.28	31.83	56.48	10.54	3.92	6.68	23.39	449.38	449.38
6002151 PEN HEART RM SE	1.00	13.30	0.00	0.51	181.68	0.00	0.00	0.00	3.92	13.01	0.00	212.42	212.42
6002353 SPLIT SHEET	3.00	0.76	3.84	1.54	9.88	0.57	1.02	0.19	11.76	0.71	0.42	30.70	10.23
6002359 ADDITIONAL PERS	1.00	0.79	160.55	0.51	69.26	24.00	42.59	7.95	3.92	4.96	17.63	332.14	332.14
6002634 AORTIC PUNCH	1.00	1.29	0.00	0.51	8.87	0.00	0.00	0.00	3.92	0.64	0.00	15.23	15.23
6002751 BOVIE PENCIL-RE	1.00	0.33	1.81	0.51	4.65	0.27	0.48	0.09	3.92	0.33	0.20	12.59	12.59
6002773 SLUSH MACHINE	1.00	0.83	4.22	0.51	10.85	0.63	1.12	0.21	3.92	0.78	0.46	23.53	23.53
10 OPERATING ROOM	9.00	27.11	383.35	4.61	378.46	57.30	101.68	18.98	35.29	27.10	42.10	1075.99	119.55
6812177 THOMAS PUMP SET	1.00	0.87	97.14	12.63	167.80	6.82	17.87	3.91	40.46	6.40	7.85	361.74	361.74
12 PERFUSIONIST	1.00	0.87	97.14	12.63	167.80	6.82	17.87	3.91	40.46	6.40	7.85	361.74	361.74
7306008 ANESTHES SUPP 4	1.00	2.05	27.73	1.29	46.86	4.14	7.36	1.37	9.87	3.36	3.05	107.07	107.07
7306026 INTRA-OP EKG	1.00	0.38	5.17	0.24	8.73	0.77	1.37	0.26	1.84	0.63	0.57	19.95	19.95
7306033 AUTO NON-INVA B	1.00	0.13	1.71	0.08	2.88	0.25	0.45	0.08	0.61	0.21	0.19	6.58	6.58
7306040 PERC SHEATH INT	1.00	0.68	9.23	0.43	15.60	1.38	2.45	0.46	3.28	1.12	1.01	35.64	35.64
7307044 SWAN GANZ CATHE	1.00	1.34	18.20	0.85	30.76	2.72	4.83	0.90	6.48	2.20	2.00	70.29	70.29
7307046 PULSE OXIMETER	1.00	0.35	4.70	0.22	7.95	0.70	1.25	0.23	1.67	0.57	0.52	18.17	18.17
7307047 END TIDAL CO2 M	1.00	0.35	4.70	0.22	7.95	0.70	1.25	0.23	1.67	0.57	0.52	18.17	18.17
30 ANESTHESIA	7.00	5.28	71.44	3.32	120.74	10.68	18.95	3.54	25.42	8.65	7.85	275.86	39.41
7470002 INTRA OP SWAN L	1.00	0.50	6.74	0.31	11.39	1.01	1.79	0.33	2.40	0.82	0.74	26.03	26.03
7470003 INTRA OP ARTERI	1.00	0.33	4.48	0.21	7.58	0.67	1.19	0.22	1.60	0.54	0.49	17.31	17.31
7470005 INTRA OP CARDIA	1.00	0.25	3.38	0.16	5.72	0.51	0.90	0.17	1.20	0.41	0.37	13.06	13.06
7470006 SL BLOOD GAS	3.00	0.96	12.99	0.60	21.96	1.94	3.45	0.64	4.62	1.57	1.43	50.18	16.73
7470008 SL NA/K	7.00	1.38	18.63	0.87	31.48	2.78	4.94	0.92	6.63	2.25	2.05	71.93	10.28
7470009 SL GLUCOSE	7.00	0.69	9.34	0.43	15.79	1.40	2.48	0.46	3.32	1.13	1.03	36.08	5.15
7470010 TRANSPORT MONIT	1.00	0.29	3.87	0.18	6.54	0.58	1.03	0.19	1.38	0.47	0.43	14.94	14.94
7470011 INTRA OP HEMOCH	1.00	0.29	3.87	0.18	6.54	0.58	1.03	0.19	1.38	0.47	0.43	14.94	14.94
7470014 MISCELLANEOUS C	1.00	0.48	6.55	0.30	11.07	0.98	1.74	0.32	2.33	0.79	0.72	25.28	25.28
7470015 SL ION CALCIUM	7.00	0.69	9.34	0.43	15.79	1.40	2.48	0.46	3.32	1.13	1.03	36.08	5.15
7470016 IN-LINE SENSOR	1.00	0.12	1.59	0.07	2.68	0.24	0.42	0.08	0.56	0.19	0.17	6.13	6.13
7470029 3 DISPOSABLE TR	1.00	1.26	17.05	0.79	28.81	2.55	4.52	0.84	6.07	2.06	1.87	65.83	65.83
7470030 2 SL BLOOD GASE	4.00	2.56	34.62	1.61	58.51	5.17	9.18	1.71	12.32	4.19	3.80	133.68	33.42
35 STAT LAB	36.00	9.79	132.46	6.16	223.85	19.80	35.14	6.56	47.14	16.03	14.55	511.46	14.21
7107102 CHEST PA & LATE	2.00	1.57	5.10	3.39	5.10	3.67	6.25	1.11	16.35	4.90	2.75	50.17	25.09
7107106 CHEST PORTABLE	3.00	9.81	31.85	5.09	31.89	22.91	39.05	6.91	24.52	30.63	17.16	219.81	73.27
45 RADIOLOGY-GENERAL	5.00	11.38	36.95	8.49	36.99	26.57	45.29	8.01	40.87	35.53	19.90	269.98	54.00
7933000 GLUCOSE	2.00	0.15	3.03	7.40	1.52	0.59	1.50	0.51	3.99	0.79	0.62	20.11	10.06
7933006 CHEM 6	1.00	0.08	1.52	3.70	1.44	0.76	0.75	0.26	2.00	0.74	0.80	12.03	12.03
7933007 CHEM 7	3.00	0.23	4.57	11.10	4.79	2.61	2.27	0.77	5.99	2.48	2.74	37.54	12.51
7933020 CHEM 20	4.00	1.38	27.13	14.80	12.08	4.22	13.46	4.58	7.98	6.26	4.43	96.34	24.08
7933040 MAGNESIUM	1.00	0.15	2.85	3.70	1.27	0.44	1.41	0.48	2.00	0.66	0.46	13.41	13.41
7933060 POTASSIUM	2.00	0.15	3.03	7.40	1.39	0.50	1.50	0.51	3.99	0.72	0.52	19.72	9.86

COST COMPONENT EXPENSES BY DRG/PATIENT/DEPT/CHARGE CODE
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DRG 106 CORONARY BYPASS W/ CAR													
7933651 T3 UPTAKE	1.00	0.17	3.26	3.70	1.45	0.51	1.62	0.55	2.00	0.75	0.53	14.53	14.53
7933652 T4 RIA	1.00	0.17	3.26	3.70	1.45	0.51	1.62	0.55	2.00	0.75	0.53	14.53	14.53
7933653 FTI	1.00	0.13	2.51	3.70	1.12	0.39	1.24	0.42	2.00	0.58	0.41	12.49	12.49
82 CHEMISTRY	16.00	2.61	51.16	59.19	26.50	10.53	25.38	8.64	31.93	13.73	11.04	240.70	15.04
7944000 CBC AND DIFF	1.00	0.15	7.66	0.04	5.87	0.04	2.54	1.04	1.08	1.61	0.45	20.48	20.48
7944060 HEM 8	5.00	0.32	16.27	0.19	12.48	0.12	5.39	2.21	5.38	3.43	1.30	47.08	9.42
7944070 CBC AND DIFF (F	3.00	0.16	8.13	0.11	6.27	0.12	2.69	1.10	3.23	1.72	1.28	24.82	8.27
7944280 PROTIME	2.00	0.13	6.51	0.08	5.02	0.10	2.16	0.88	2.15	1.38	1.04	19.44	9.72
7944290 PTT	8.00	0.51	26.03	0.31	20.09	0.39	8.62	3.53	8.60	5.52	4.11	77.72	9.71
84 HEMATOLOGY	19.00	1.27	64.59	0.73	49.74	0.77	21.40	8.76	20.43	13.67	8.19	189.53	9.98
7978000 STAT CHARGE	9.00	1.38	33.21	18.17	14.96	2.47	15.36	4.44	12.14	7.06	6.84	116.04	12.89
7978001 IP COLLECTION	9.00	0.81	19.56	10.70	8.81	1.46	9.05	2.62	7.15	4.16	4.03	68.35	7.59
7978532 FREE T4	1.00	1.04	25.07	13.72	11.29	1.87	11.59	3.35	9.17	5.33	5.17	87.60	87.60
86 LAB COLLECTION/PROCESS	19.00	3.23	77.85	42.58	35.07	5.80	36.00	10.41	28.46	16.55	16.04	271.99	14.32
7922025 TYPE SCREEN HOL	1.00	0.79	7.46	0.20	40.06	0.61	3.33	0.93	2.75	2.10	1.83	60.04	60.04
7922116 CROSSMATCH	5.00	3.79	35.61	0.98	23.71	0.24	15.88	4.42	13.73	1.24	0.73	100.33	20.07
7922550 PLSM PROT FRAC	2.00	1.30	12.21	0.39	62.43	0.95	5.44	1.52	5.49	3.27	2.84	95.84	47.92
90 BLOOD BANK	8.00	5.88	55.28	1.56	126.20	1.80	24.65	6.87	21.98	6.60	5.39	256.21	32.03
7087900 ARTERIAL BLOOD	11.00	2.52	52.62	8.77	21.72	6.47	49.49	9.38	52.33	15.58	10.94	229.81	20.89
100 INHALATION THERAPY	11.00	2.52	52.62	8.77	21.72	6.47	49.49	9.38	52.33	15.58	10.94	229.81	20.89
7424101 OXY CANNULA CON	1.00	0.00	0.00	0.27	3.10	0.34	0.00	0.00	0.97	0.74	0.52	5.94	5.94
7424102 OXY CANNULA PRN	4.00	0.00	0.00	1.09	12.41	1.34	0.00	0.00	3.87	2.96	2.09	23.75	5.94
7424113 VENTILATOR VOLU	1.00	0.00	0.00	0.27	30.26	3.27	0.00	0.00	0.97	7.21	5.08	47.08	47.08
7424116 OXYGEN TRANSPOR	1.00	2.62	38.42	0.27	4.06	0.44	6.37	1.44	0.97	0.97	0.68	56.24	56.24
7424119 SX GASTRIC	1.00	0.00	0.00	0.27	3.49	0.38	0.00	0.00	0.97	0.83	0.59	6.53	6.53
7424121 SX THORACIC	1.00	0.00	0.00	0.27	3.49	0.38	0.00	0.00	0.97	0.83	0.59	6.53	6.53
7424122 SX TRACHEAL	1.00	0.00	0.00	0.27	3.49	0.38	0.00	0.00	0.97	0.83	0.59	6.53	6.53
7424125 RX I.S. PER/RX	5.00	0.00	0.00	1.36	0.00	0.00	0.00	0.00	4.84	0.00	0.00	6.19	1.24
7424138 OXYGEN SET UP	1.00	0.56	8.28	0.27	0.88	0.09	1.37	0.31	0.97	0.21	0.15	13.09	13.09
7424140 VENTILATOR SET	1.00	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.97	0.00	0.00	1.24	1.24
7424141 SUCTION SET UP	3.00	1.94	28.51	0.82	3.01	0.33	4.73	1.07	2.90	0.72	0.51	44.53	14.84
7424142 RX NEWSTART	1.00	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.97	0.00	0.00	1.24	1.24
7424143 OXYGEN COE	1.00	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.97	0.00	0.00	1.24	1.24
7424147 STERILE WATER 2	1.00	0.67	9.88	0.27	1.04	0.11	1.64	0.37	0.97	0.25	0.18	15.38	15.38
7424155 EQP. I.S. DISP.	1.00	0.91	13.35	0.27	1.41	0.15	2.21	0.50	0.97	0.34	0.24	20.35	20.35
7424176 MONITOR CO2/OXI	2.00	5.23	76.84	0.54	8.13	0.88	12.74	2.88	1.93	1.94	1.37	112.48	56.24
104 RESPIRATORY THERAPY	26.00	11.94	175.27	7.07	74.79	8.09	29.06	6.57	25.14	17.83	12.57	368.33	14.17
6901003 ELECTROCARDIOGR	5.00	1.11	19.30	1.13	45.47	7.71	6.59	1.21	10.54	5.01	2.59	100.66	20.13
6901012 STAT EKG	1.00	0.35	5.99	0.23	14.12	2.39	2.05	0.38	2.11	0.79	0.80	29.20	29.20
130 EKG	6.00	1.46	25.29	1.36	59.59	10.10	8.64	1.58	12.65	5.79	3.39	129.85	21.64

COST COMPONENT EXPENSES BY DRG/PATIENT/DEPT/CHARGE CODE
DATA REQUESTS #4-6 FROM TABLE 1
SAMPLE REPORT

DATE/TIME: 20-NOV-91 02:59 PM

	TOTAL UNITS	DIR FIX SALARY	DIR VAR SALARY	DIR FIX NON-SAL	DIR VAR NON-SAL	DIR FIX CAPITAL	IND FIX SALARY	IND VAR SALARY	IND FIX NON-SAL	IND VAR NON-SAL	IND FIX CAPITAL	TOTAL COSTS	TOT COST PER UNIT
DRG 106 CORONARY BYPASS W/ CAR													
6218526 MCGAW PUMP/DAY	17.00	0.03	0.61	0.60	45.53	0.58	0.19	0.04	5.12	3.04	2.70	58.44	3.44
6330010 ADMISSION KIT	1.00	0.00	0.04	0.04	3.20	0.03	0.01	0.00	0.30	0.21	0.16	4.01	4.01
6330252 BLOOD-PACK UN 4	2.00	0.00	0.02	0.07	1.60	0.07	0.01	0.00	0.60	0.11	0.32	2.80	1.40
6330407 POUCH,TELEMTRY	1.00	0.00	0.04	0.04	3.20	0.03	0.01	0.00	0.30	0.21	0.16	4.01	4.01
6330967 CATH 2WAY 5CC 1	1.00	0.00	0.04	0.04	3.20	0.03	0.01	0.00	0.30	0.21	0.16	4.01	4.01
6331108 CATH ALL PURPOS	2.00	0.00	0.09	0.07	6.41	0.07	0.03	0.01	0.60	0.43	0.32	8.02	4.01
6331148 CATH THORACIC 3	2.00	0.00	0.09	0.07	6.41	0.07	0.03	0.01	0.60	0.43	0.32	8.02	4.01
6331152 CATH THOR R ANG	3.00	0.01	0.13	0.11	9.61	0.10	0.04	0.01	0.90	0.64	0.48	12.03	4.01
6332223 DRAIN SHIRLEY W	1.00	0.00	0.01	0.04	1.07	0.03	0.00	0.00	0.30	0.07	0.16	1.69	1.69
6335001 RAZOR PREP	1.00	0.00	0.04	0.04	3.20	0.03	0.01	0.00	0.30	0.21	0.16	4.01	4.01
6335083 PLUG M/LL DEADE	4.00	0.01	0.17	0.14	12.82	0.14	0.05	0.01	1.20	0.86	0.64	16.04	4.01
6335101 BAG,ATS PLEUR-E	1.00	0.00	0.01	0.04	0.88	0.03	0.00	0.00	0.30	0.06	0.16	1.49	1.49
6335103 PLEUR-EVAC CHES	1.00	0.00	0.04	0.04	3.20	0.03	0.01	0.00	0.30	0.21	0.16	4.01	4.01
6336010 SHAVE PREP KIT	1.00	0.00	0.04	0.04	3.20	0.03	0.01	0.00	0.30	0.21	0.16	4.01	4.01
6336204 STOCK KNEE LG R	2.00	0.00	0.09	0.07	6.41	0.07	0.03	0.01	0.60	0.43	0.32	8.02	4.01
6336242 SUCT TRAY 14FR	1.00	0.00	0.04	0.04	3.20	0.03	0.01	0.00	0.30	0.21	0.16	4.01	4.01
6336243 SUCT YANKAUER S	2.00	0.00	0.09	0.07	6.41	0.07	0.03	0.01	0.60	0.43	0.32	8.02	4.01
6336280 SUTURE REMOVAL	1.00	0.00	0.04	0.04	3.20	0.03	0.01	0.00	0.30	0.21	0.16	4.01	4.01
6337013 TAPE DURAPORE 1	1.00	0.00	0.04	0.04	3.20	0.03	0.01	0.00	0.30	0.21	0.16	4.01	4.01
6337014 TAPE DURAPORE 2	3.00	0.01	0.13	0.11	9.61	0.10	0.04	0.01	0.90	0.64	0.48	12.03	4.01
6337033 THORA-DRAIN SET	1.00	0.00	0.04	0.04	3.20	0.03	0.01	0.00	0.30	0.21	0.16	4.01	4.01
6337054 TRANSDUCER DISP	1.00	0.00	0.04	0.04	3.20	0.03	0.01	0.00	0.30	0.21	0.16	4.01	4.01
6337056 TRANSPACK 2000	1.00	0.00	0.01	0.04	0.59	0.03	0.00	0.00	0.30	0.04	0.16	1.17	1.17
6337253 TUBE LEVINE PLA	1.00	0.00	0.00	0.04	0.22	0.03	0.00	0.00	0.30	0.01	0.16	0.77	0.77
6337297 TUBE PR ST 3/4	1.00	0.00	0.04	0.04	3.20	0.03	0.01	0.00	0.30	0.21	0.16	4.01	4.01
6340020 BAND DEPUY 4" D	1.00	0.00	0.04	0.04	3.20	0.03	0.01	0.00	0.30	0.21	0.16	4.01	4.01
6340205 SPONGE 4X4 10'S	1.00	0.00	0.04	0.04	3.20	0.03	0.01	0.00	0.30	0.21	0.16	4.01	4.01
6340206 SPONGE 4X4 DRAI	1.00	0.00	0.04	0.04	3.20	0.03	0.01	0.00	0.30	0.21	0.16	4.01	4.01
6350151 ANGIOCATH 14X5	2.00	0.00	0.09	0.07	6.41	0.07	0.03	0.01	0.60	0.43	0.32	8.02	4.01
6350154 ANGIOCATH 16X5	4.00	0.01	0.17	0.14	12.82	0.14	0.05	0.01	1.20	0.86	0.64	16.04	4.01
6350163 ANGIOSET 22X3/4	2.00	0.00	0.09	0.07	6.41	0.07	0.03	0.01	0.60	0.43	0.32	8.02	4.01
6350164 ANGIOSET 20X1	1.00	0.00	0.04	0.04	3.20	0.03	0.01	0.00	0.30	0.21	0.16	4.01	4.01
6350196 BLOOD ADM SET &	1.00	0.00	0.04	0.04	3.20	0.03	0.01	0.00	0.30	0.21	0.16	4.01	4.01
6350311 CATH ADAPTER/LL	2.00	0.00	0.01	0.07	0.47	0.07	0.00	0.00	0.60	0.03	0.32	1.57	0.78
6350323 CAP,IV INJECTIO	1.00	0.00	0.04	0.04	3.20	0.03	0.01	0.00	0.30	0.21	0.16	4.01	4.01
6350362 SOL VOL INFUSIO	1.00	0.00	0.04	0.04	3.20	0.03	0.01	0.00	0.30	0.21	0.16	4.01	4.01
6350398 INLINE FILTER S	4.00	0.01	0.17	0.14	12.82	0.14	0.05	0.01	1.20	0.86	0.64	16.04	4.01
6350722 IV CATH CARE KI	4.00	0.01	0.17	0.14	12.82	0.14	0.05	0.01	1.20	0.86	0.64	16.04	4.01
6350782 SECONDARY 1832	2.00	0.00	0.09	0.07	6.41	0.07	0.03	0.01	0.60	0.43	0.32	8.02	4.01
6351330 COIL,BLOOD WARM	1.00	0.00	0.04	0.04	3.20	0.03	0.01	0.00	0.30	0.21	0.16	4.01	4.01
6355096 PUMP/PRIMARY UN	2.00	0.00	0.09	0.07	6.41	0.07	0.03	0.01	0.60	0.43	0.32	8.02	4.01
6355097 PUMP/PRIMARY VE	1.00	0.00	0.04	0.04	3.20	0.03	0.01	0.00	0.30	0.21	0.16	4.01	4.01
150 CENTRAL SUPPLY	84.00	0.16	3.21	2.95	239.41	2.87	1.00	0.24	25.30	15.97	13.35	304.45	3.62
7600001 IV ADMIX SERVIC	4.00	0.05	0.75	1.64	4.36	0.03	0.26	0.07	1.46	0.37	0.72	9.71	2.43
7600238 LIDOCAINE INJ	1.00	0.05	0.82	0.41	4.77	0.04	0.28	0.07	0.37	0.41	0.18	7.40	7.40

COST COMPONENT EXPENSES BY DRG/PATIENT/DEPT/CHARGE CODE
DATA REQUESTS #4-6 FROM TABLE 1
SAMPLE REPORT

	TOTAL UNITS	DIR FIX SALARY	DIR VAR SALARY	DIR FIX NON-SAL	DIR VAR NON-SAL	DIR FIX CAPITAL	IND FIX SALARY	IND VAR SALARY	IND FIX NON-SAL	IND VAR NON-SAL	IND FIX CAPITAL	TOTAL COSTS	TOT COST PER UNIT
DRG 106 CORONARY BYPASS W/ CAR													
7601001 IV HEPARIN 100	2.00	0.31	4.57	0.82	1.67	0.01	1.56	0.42	0.73	0.14	0.36	10.58	5.29
7607004 IV CEFAZOLIN 0.	6.00	0.92	13.70	2.46	9.27	0.05	4.69	1.25	2.19	0.79	1.08	36.39	6.07
7607024 IV CEFAZOLIN 1	5.00	0.76	11.42	2.05	11.93	0.08	3.91	1.04	1.83	1.02	0.90	34.93	6.99
7607174 IV ZANTAC 50 MG	3.00	0.46	6.85	1.23	10.68	0.07	2.35	0.62	1.10	0.91	0.54	24.81	8.27
7607739 LEVOPHED 4MG IV	1.00	0.02	0.35	0.41	2.04	0.02	0.12	0.03	0.37	0.17	0.18	3.71	3.71
7608332 CARDIOPLEGIC/MU	3.00	0.94	14.01	1.23	81.78	0.64	4.80	1.28	1.10	6.96	0.54	113.28	37.76
7608518 D5W 250ML,HEPAR	2.00	0.26	3.81	0.82	22.24	0.17	1.31	0.35	0.73	1.89	0.36	31.94	15.97
7608532 D5W 250ML LEVOP	3.00	0.26	3.83	1.23	22.33	0.18	1.31	0.35	1.10	1.90	0.54	33.01	11.00
7609155 IV SOD BICARB 8	3.00	0.46	6.85	1.23	4.71	0.03	2.35	0.62	1.10	0.40	0.54	18.28	6.09
7609275 IV KCL 20 MEQ.	6.00	0.92	13.70	2.46	3.82	0.01	4.69	1.25	2.19	0.33	1.08	30.44	5.07
7611044 ACETOMINOPHEN 1	1.00	0.00	0.04	0.41	0.20	0.00	0.01	0.00	0.37	0.02	0.18	1.23	1.23
7611064 MAALOX 30 CC UD	1.00	0.00	0.04	0.41	0.20	0.00	0.01	0.00	0.37	0.02	0.18	1.23	1.23
7612243 FERRO-SEQUELS	7.00	0.02	0.25	2.87	1.43	0.01	0.08	0.02	2.56	0.12	1.25	8.61	1.23
7612683 ASA 1 1/4 GR TA	5.00	0.01	0.12	2.05	0.68	0.01	0.04	0.01	1.83	0.06	0.90	5.69	1.14
7620600 MORPHINE IVP	3.00	0.06	0.91	1.23	5.32	0.04	0.31	0.08	1.10	0.45	0.54	10.04	3.35
7624027 MEPERIDINE 75MG	1.00	0.15	2.28	0.41	0.64	0.00	0.78	0.21	0.37	0.05	0.18	5.07	5.07
7624029 MEPERIDINE 50 M	3.00	0.46	6.85	1.23	1.91	0.00	2.35	0.62	1.10	0.16	0.54	15.22	5.07
7624036 FENTANYL 20 CC	4.00	0.61	9.13	1.64	11.28	0.08	3.13	0.83	1.46	0.96	0.72	29.84	7.46
7644269 VERSED 10MG/ZML	2.00	0.31	4.57	0.82	15.13	0.12	1.56	0.42	0.73	1.29	0.36	25.30	12.65
7644629 DARVOCET-N 100	6.00	0.92	13.70	2.46	3.62	0.00	4.69	1.25	2.19	0.31	1.08	30.22	5.04
7644729 VALIUM 10 MG TA	1.00	0.00	0.06	0.41	0.34	0.00	0.02	0.01	0.37	0.03	0.18	1.41	1.41
7646894 HALCION 0.25 MG	1.00	0.00	0.04	0.41	0.20	0.00	0.01	0.00	0.37	0.02	0.18	1.23	1.23
7663856 DEX 5%W 250 CC	3.00	0.46	6.85	1.23	2.88	0.01	2.35	0.62	1.10	0.25	0.54	16.28	5.43
7663900 SALINE NORMAL	5.00	0.76	11.42	2.05	4.72	0.02	3.91	1.04	1.83	0.40	0.90	27.05	5.41
7663906 DEX 5%W 1000 CC	1.00	0.15	2.28	0.41	1.04	0.00	0.78	0.21	0.37	0.09	0.18	5.52	5.52
7663907 DEX 5%W 500 CC	1.00	0.15	2.28	0.41	0.96	0.00	0.78	0.21	0.37	0.08	0.18	5.43	5.43
7663912 DEX 5% .45 S 10	1.00	0.15	2.28	0.41	1.09	0.00	0.78	0.21	0.37	0.09	0.18	5.57	5.57
7663917 DEX 5% .2 S 500	4.00	0.00	0.00	1.64	1.93	0.02	0.00	0.00	1.46	0.16	0.72	5.93	1.48
7663919 LAC.RINGERS 100	3.00	0.46	6.85	1.23	3.36	0.01	2.35	0.62	1.10	0.29	0.54	16.80	5.60
7663924 SALINE NORMAL 1	6.00	0.92	13.70	2.46	7.12	0.03	4.69	1.25	2.19	0.61	1.08	34.04	5.67
7663943 SALINE .9 IRR.	1.00	0.15	2.28	0.41	1.08	0.00	0.78	0.21	0.37	0.09	0.18	5.56	5.56
7663962 NS 500ML/HEPARI	1.00	0.15	2.28	0.41	2.18	0.01	0.78	0.21	0.37	0.19	0.18	6.76	6.76
7670673 HEPARIN 5000U	9.00	1.38	20.55	3.69	12.78	0.07	7.04	1.87	3.29	1.09	1.61	53.36	5.93
7671282 NTG DRIP 250ML	1.00	0.15	2.28	0.41	1.65	0.01	0.78	0.21	0.37	0.14	0.18	6.18	6.18
7673850 SALINE FLUSH IN	10.00	1.53	22.83	4.10	8.95	0.03	7.82	2.08	3.65	0.76	1.79	53.55	5.36
7675169 PROTAMINE 250 M	2.00	0.31	4.57	0.82	11.83	0.09	1.56	0.42	0.73	1.01	0.36	21.69	10.85
7675211 TAGAMET 300 MG	2.00	0.06	0.86	0.82	5.04	0.04	0.30	0.08	0.73	0.43	0.36	8.72	4.36
7675212 CA CHLORIDE 10	2.00	0.31	4.57	0.82	1.41	0.00	1.56	0.42	0.73	0.12	0.36	10.29	5.15
7675262 CLINORIL 150 MG	8.00	0.04	0.65	3.28	3.82	0.03	0.22	0.06	2.92	0.32	1.43	12.79	1.60
7675264 CLINORIL 200 MG	2.00	0.01	0.19	0.82	1.09	0.01	0.06	0.02	0.73	0.09	0.36	3.38	1.69
7675432 REGLAN 2 ML AMP	3.00	0.06	0.91	1.23	5.32	0.04	0.31	0.08	1.10	0.45	0.54	10.04	3.35
7675457 LOPRESSOR 50 MG	14.00	0.03	0.49	5.74	2.86	0.02	0.17	0.04	5.11	0.24	2.51	17.23	1.23
7676025 NITRO GLYCERIN	1.00	0.15	2.28	0.41	1.52	0.01	0.78	0.21	0.37	0.13	0.18	6.04	6.04
7676513 ADRENALIN 1CC 1	2.00	0.04	0.61	0.82	3.54	0.03	0.21	0.06	0.73	0.30	0.36	6.69	3.35
7676769 BENADRYL AMPS 5	1.00	0.02	0.30	0.41	1.77	0.01	0.10	0.03	0.37	0.15	0.18	3.35	3.35
7676777 BENADRYL 25MG C	1.00	0.00	0.04	0.41	0.20	0.00	0.01	0.00	0.37	0.02	0.18	1.23	1.23

COST COMPONENT EXPENSES BY DRG/PATIENT/DEPT/CHARGE CODE
DATA REQUESTS #4-6 FROM TABLE 1
SAMPLE REPORT
DATE/TIME: 20-NOV-91 02:59 PM

	TOTAL UNITS	DIR FIX SALARY	DIR VAR SALARY	DIR FIX NON-SAL	DIR VAR NON-SAL	DIR FIX CAPITAL	IND FIX SALARY	IND VAR SALARY	IND FIX NON-SAL	IND VAR NON-SAL	IND FIX CAPITAL	TOTAL COSTS	TOT COST PER UNIT
DRG 106 CORONARY BYPASS W/ CAR													
7676977 COMPAZINE 2 ML	1.00	0.02	0.30	0.41	1.77	0.01	0.10	0.03	0.37	0.15	0.18	3.35	3.35
7677715 LANOXIN 0.25MG	6.00	0.01	0.21	2.46	1.23	0.01	0.07	0.02	2.19	0.10	1.08	7.38	1.23
7678017 NEOSYNEPH 1% 1C	2.00	0.31	4.57	0.82	5.44	0.04	1.56	0.42	0.73	0.46	0.36	14.70	7.35
7678029 NITROSTAT 0.4MG	2.00	0.31	4.57	0.82	2.76	0.01	1.56	0.42	0.73	0.23	0.36	11.77	5.88
7678111 PAPAVERINE 30MG	1.00	0.04	0.64	0.41	3.75	0.03	0.22	0.06	0.37	0.32	0.18	6.02	6.02
7678210 FAMOTIDINE 40MG	2.00	0.02	0.33	0.82	1.91	0.01	0.11	0.03	0.73	0.16	0.36	4.49	2.24
7678796 NICARDIPINE 20M	6.00	0.91	13.60	2.46	79.35	0.62	4.66	1.24	2.19	6.75	1.08	112.86	18.81
7678861 SYNTHROID .15 M	7.00	0.02	0.25	2.87	1.43	0.01	0.08	0.02	2.56	0.12	1.25	8.61	1.23
7678888 ZANTAC 150 MG.	10.00	1.53	22.83	4.10	12.95	0.06	7.82	2.08	3.65	1.10	1.79	57.92	5.79
7679203 HEPARIN 10 ML	5.00	0.76	11.42	2.05	7.10	0.04	3.91	1.04	1.83	0.60	0.90	29.65	5.93
7679453 NITRO-DUR 10 CM	7.00	1.07	15.98	2.87	3.64	0.00	5.48	1.46	2.56	0.31	1.25	34.62	4.95
7679683 INSULIN REG U-1	1.00	0.15	2.28	0.41	4.11	0.03	0.78	0.21	0.37	0.35	0.18	8.87	8.87
7679723 HETASTARCH 6%/S	5.00	0.76	11.42	2.05	183.71	1.48	3.91	1.04	1.83	15.64	0.90	222.74	44.55
7679928 PROCAN-SR 500 M	4.00	0.01	0.14	1.64	0.82	0.01	0.05	0.01	1.46	0.07	0.72	4.92	1.23
7679974 ANTICOAGULANT 5	1.00	0.09	1.27	0.41	7.43	0.06	0.44	0.12	0.37	0.63	0.18	10.98	10.98
160 PHARMACY	218.00	21.42	319.80	89.41	626.09	4.53	109.58	29.16	79.57	53.29	39.08	1371.93	6.29
7328601 IV. NEW START	1.00	0.29	4.37	1.53	10.39	0.08	1.50	0.40	1.36	0.88	0.67	21.46	21.46
7328602 IV. RESTART	1.00	0.22	3.24	1.13	7.69	0.06	1.11	0.30	1.01	0.65	0.49	15.89	15.89
7328604 IV. SITE ASSESS	6.00	0.51	7.56	2.64	17.96	0.13	2.59	0.69	2.35	1.53	1.15	37.11	6.18
7328616 IV NEW ASSESSME	1.00	0.26	3.90	1.36	9.27	0.07	1.34	0.36	1.21	0.79	0.60	19.16	19.16
7328708 HEPARIN FLUSH I	2.00	0.06	0.84	0.29	2.00	0.01	0.29	0.08	0.26	0.17	0.13	4.12	2.06
165 IV THERAPY	11.00	1.33	19.91	6.95	47.30	0.35	6.82	1.82	6.19	4.03	3.04	97.74	8.89
6801003 LEFT HEART CATH	1.00	1.68	55.92	15.44	112.23	0.00	26.76	6.36	16.20	10.64	9.40	254.64	254.64
6801015 FLOUROFIRST30MI	1.00	0.18	6.07	15.44	12.17	2.55	2.90	0.69	16.20	1.15	1.02	58.38	58.38
6801016 FLOUROADDITIONA	1.00	0.05	1.72	15.44	3.46	0.72	0.82	0.20	16.20	0.33	0.29	39.23	39.23
6801024 DIAGNOSTIC CATH	2.00	0.15	5.00	30.89	10.03	2.10	2.39	0.57	32.40	0.95	0.84	85.33	42.66
6801032 INTRO SHEAT SET	1.00	0.07	2.50	15.44	5.02	1.05	1.20	0.28	16.20	0.48	0.42	42.66	42.66
6801040 DISPOSABLE TRAN	1.00	0.14	4.54	15.44	9.10	1.91	2.17	0.52	16.20	0.86	0.76	51.64	51.64
6801072 LG STERIMED COV	1.00	1.88	62.83	15.44	126.10	26.40	30.07	7.15	16.20	11.95	10.56	308.59	308.59
6802001 2 HR CCLSS	1.00	1.88	62.83	15.44	126.10	26.40	30.07	7.15	16.20	11.95	10.56	308.59	308.59
190 CARDIAC CATH	9.00	6.04	201.41	138.99	404.22	61.13	96.40	22.91	145.80	38.32	33.85	1149.06	127.67
8419005 POST OPEN HRT E	2.00	92.12	0.00	12.96	1.58	3.71	5.31	1.12	7.69	2.89	1.83	129.19	64.60
220 PATIENT ED/REHAB	2.00	92.12	0.00	12.96	1.58	3.71	5.31	1.12	7.69	2.89	1.83	129.19	64.60
2310040 ROOM & CARE- 3E	5.00	25.47	229.27	4.96	126.31	32.28	59.57	14.91	107.95	26.11	22.40	649.24	129.85
3218421 TELEMETRY/DAY 3	5.00	25.47	229.27	4.96	126.31	32.28	59.57	14.91	107.95	26.11	22.40	649.24	129.85
250 3E	10.00	50.95	458.54	9.92	252.62	64.56	119.13	29.83	215.91	52.22	44.80	1298.48	129.85
2310080 ROOM & CARE- 5E	2.00	12.11	108.98	1.53	34.87	16.66	28.84	7.17	57.74	12.76	11.48	292.13	146.07
3290501 TELEMETRY/DAY 5	1.00	6.05	54.49	0.77	17.43	8.33	14.42	3.59	28.87	6.38	5.74	146.07	146.07
270 5E	3.00	18.16	163.46	2.30	52.30	24.98	43.27	10.76	86.62	19.14	17.21	438.20	146.07
2310020 ROOM & CARE- I	2.00	43.31	210.34	50.59	19.03	10.35	31.68	12.49	38.43	16.61	10.80	443.64	221.82

COST COMPONENT EXPENSES BY DRG/PATIENT/DEPT/CHARGE CODE
DATA REQUESTS #4-6 FROM TABLE 1
SAMPLE REPORT

	TOTAL UNITS	DIR FIX SALARY	DIR VAR SALARY	DIR FIX NON-SAL	DIR VAR NON-SAL	DIR FIX CAPITAL	IND FIX SALARY	IND VAR SALARY	IND FIX NON-SAL	IND VAR NON-SAL	IND FIX CAPITAL	TOTAL COSTS	TOT COST PER UNIT
DRG 106 CORONARY BYPASS W/ CAR													
3502000 CARDIAC OP ICE	2.00	43.31	210.34	50.59	19.03	10.35	31.68	12.49	38.43	16.61	10.80	443.64	221.82
3502004 INVASIVE PRESSU	2.00	43.31	210.34	50.59	19.03	10.35	31.68	12.49	38.43	16.61	10.80	443.64	221.82
3502007 TEMP INTERNAL P	2.00	43.31	210.34	50.59	19.03	10.35	31.68	12.49	38.43	16.61	10.80	443.64	221.82
300 ICU-EAST	8.00	173.23	841.35	202.37	76.13	41.41	126.73	49.96	153.74	66.43	43.20	1774.54	221.82
8662130 NUTRITION CONSU	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
500 MISCELLANEOUS	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1046881	509.00	446.74	3231.07	622.31	3021.10	368.28	921.79	238.98	1102.92	435.75	356.15	10745.09	21.11
6561025 [illegible]	1.00	3.19	43.19	2.01	72.99	6.46	11.46	2.14	15.37	5.23	4.74	166.77	166.77
5 23	1.00	3.19	43.19	2.01	72.99	6.46	11.46	2.14	15.37	5.23	4.74	166.77	166.77
6000056 3 HOURS (O R)	1.00	7.82	160.55	0.51	70.68	24.00	42.59	7.95	3.92	5.06	17.63	340.70	340.70
6000916 BOVIE MACH ELEC	1.00	0.41	65.72	0.51	29.48	9.82	17.43	3.25	3.92	2.11	7.22	139.88	139.88
6001518 TEFLON FELT/SH	1.00	0.58	2.94	0.51	7.55	0.44	0.78	0.15	3.92	0.54	0.32	17.73	17.73
6001567 FORGARTY INSERT	1.00	0.18	0.90	0.51	2.32	0.14	0.24	0.04	3.92	0.17	0.10	8.53	8.53
6001906 GLOVES (ENDERMI	4.00	0.34	1.71	2.05	4.39	0.26	0.45	0.08	15.69	0.31	0.19	25.47	6.37
6002151 PEN HEART RM SE	1.00	13.30	0.00	0.51	181.68	0.00	0.00	0.00	3.92	13.01	0.00	212.42	212.42
6002169 OPEN HEART SUPP	1.00	16.62	0.00	0.51	181.68	0.00	0.00	0.00	3.92	13.01	0.00	215.74	215.74
6002284 BULLDOGS-DISP	1.00	0.17	0.85	0.51	2.20	0.13	0.23	0.04	3.92	0.16	0.09	8.30	8.30
6002311 ACCU COUNT SHEE	1.00	0.06	0.28	0.51	0.71	0.04	0.07	0.01	3.92	0.05	0.03	5.69	5.69
6002448 VESSEL LOOPS	1.00	0.16	0.80	0.51	2.07	0.12	0.21	0.04	3.92	0.15	0.09	8.07	8.07
6002634 AORTIC PUNCH	1.00	1.29	0.00	0.51	8.87	0.00	0.00	0.00	3.92	0.64	0.00	15.23	15.23
6002641 VESSEL CANNULA	1.00	0.12	0.63	0.51	1.61	0.09	0.17	0.03	3.92	0.12	0.07	7.27	7.27
6002751 BOVIE PENCIL-RE	1.00	0.33	1.81	0.51	4.65	0.27	0.48	0.09	3.92	0.33	0.20	12.59	12.59
6002754 BIOCLUSIVE DRES	5.00	0.30	1.51	2.56	3.88	0.23	0.40	0.07	19.61	0.28	0.17	29.00	5.80
10 OPERATING ROOM	21.00	41.67	237.70	10.77	501.77	35.53	63.05	11.77	82.35	35.93	26.10	1046.63	49.84
6812183 MURPHY BONE PUM	1.00	7.79	874.21	12.63	2028.72	61.40	160.85	35.15	40.46	77.41	70.61	3369.24	3369.24
6812188 DOUBLE CELL SAV	1.00	3.17	356.16	12.63	887.46	25.01	65.53	14.32	40.46	33.86	28.77	1467.39	1467.39
12 PERFUSIONIST	2.00	10.97	1230.37	25.26	2916.18	86.41	226.39	49.47	80.93	111.27	99.38	4836.62	2418.31
6222200 DIAL-A-FLOW 30	1.00	0.00	0.00	0.00	8.86	0.00	0.00	0.00	1.48	1.08	0.86	12.28	12.28
6222204 SINGLE DIP	1.00	0.00	0.00	0.00	8.86	0.00	0.00	0.00	1.48	1.08	0.86	12.28	12.28
6223442 MINERAL OIL	1.00	0.00	0.00	0.00	8.86	0.00	0.00	0.00	1.48	1.08	0.86	12.28	12.28
15 CASE CARTS	3.00	0.00	0.00	0.00	26.59	0.00	0.00	0.00	4.43	3.24	2.58	36.83	12.28
7306006 ANESTHES SUPP 3	1.00	1.77	24.02	1.12	40.60	3.59	6.37	1.19	8.55	2.91	2.64	92.76	92.76
7306026 INTRA-OP EKG	1.00	0.38	5.17	0.24	8.73	0.77	1.37	0.26	1.84	0.63	0.57	19.95	19.95
7306033 AUTO NON-INVA B	1.00	0.13	1.71	0.08	2.88	0.25	0.45	0.08	0.61	0.21	0.19	6.58	6.58
7306040 PERC SHEATH INT	1.00	0.68	9.23	0.43	15.60	1.38	2.45	0.46	3.28	1.12	1.01	35.64	35.64
7307044 SWAN GANZ CATHE	1.00	1.34	18.20	0.85	30.76	2.72	4.83	0.90	6.48	2.20	2.00	70.29	70.29
7307046 PULSE OXIMETER	1.00	0.35	4.70	0.22	7.95	0.70	1.25	0.23	1.67	0.57	0.52	18.17	18.17
7307047 END TIDAL CO2 M	1.00	0.35	4.70	0.22	7.95	0.70	1.25	0.23	1.67	0.57	0.52	18.17	18.17
30 ANESTHESIA	7.00	5.00	67.74	3.15	114.48	10.12	17.97	3.35	24.10	8.20	7.44	261.56	37.37

Appendix G

Example Algorithm for Identifying Eligible Demo Patients

HCFA CABG DEMONSTRATION PROJECT

DEFINITION OF PATIENT INCLUSION

- Medicare as Primary Payor (5% of CABG ≥ 65 years of age have Medicare as secondary)

- Medicare - Age ≥ 65 (8% of Medicare CABG patients are < 65 years of age)

- CABG - Specific Coding Nuances (resulting in exclusion):

  -- DRG 104/105

  - CABG + Valve repair/replacement

  -- DRG 108

  - CABG + Ventricular aneurysm repair (37.32)
  - CABG + Cardiotomy (37.11)
  - CABG + Thoracic or Abdominal aortic resection (38.44)
  - CABG + Open mapping/ablation (37.33)
  - CABG + (Open) Coronary endarterectomy/angioplasty (36.03)
  - CABG + Septal defect repairs (35.5, 35.6, 35.7)
  - CABG + Replacement of other thoracic vessels (38.45)

  -- DRG 483

  - CABG + Tracheostomy (anytime in course)

- CABG + Inpatient Cath and/or PTCA Same Stay = Project DRG 106

- CABG + Outpatient Cath < 72° Preadmit = Bundled Project DRG 106

- CABG + Outpatient Cath > 72° Preadmit = Unbundled Project DRG 107
  (outpatient cath billed in routine manner)

- CABG + Cath Done Elsewhere (even if MHVI physician) = Project DRG 107
  (separate routine fee/hospital payment for cath)

- Inpatient Cath and/or PTCA Discharge = NOT Project DRG 112
  (routine billing process)

- Readmit for CABG (not time factor) = Project DRG 107

Appendix H

Explanation of Medicare Benefits

DEPARTMENT OF HEALTH & HUMAN SERVICES

Health Care Financing Administration

Medicare Participating Heart Bypass Center Demonstration
P.O. Box 11972
Baltimore, Md. 21207-0972

Telephone Number
(410) 966-6558
Fax (410) 966-5768

Date 11/02/93

EXPLANATION OF MEDICARE BENEFITS

Page 1

KEEP THIS NOTICE FOR YOUR RECORDS

Your Health Insurance
Claim Number is:

Always use this number when writing about your claim

THIS IS NOT A BILL

Approved payment is for services provided by: 360085	Service Dates From	Through
DEPT OF MEDICINE FOUNDATION	03/07/93	03/09/93
UNIVERSITY RADIOLOGISTS	03/09/93	03/12/93
DEPARTMENT OF SURGERY CORP	03/10/93	03/10/93
OHIO STATE ANESTHESIA CORP	03/10/93	03/10/93
UNIVERSITY RADIOLOGISTS	03/12/93	03/18/93

NOTE: THIS NOTICE REFLECTS YOUR LIABILITY FOR PHYSICIAN SERVICES ONLY.

Your hospital is participating in a Medicare demonstration project using a simplified payment method which combines all hospital and most physician care related to your bypass surgery.

This single payment will make the billing process easier while keeping the cost to you at or below what it would otherwise be.

The total Medicare approved amount for your heart bypass surgery is $26,952.00 of which $23,972.00 is the Part A Medicare amount for hospital services and $2,980.00 is the Part B Medicare amount for physician services (of which Medicare pays 80 %).

Medicare has paid $26,356.00 for hospital and physician services.

The total amount that you are responsible for is:	Part A Deductible:	
	Part B Deductible:	$0.00
	Part B Coinsurance:	$596.00
Your hospital will send you or your private insurer a bill for this total amount.	Total Amount:	$596.00

If you have any questions about this notice, write or call us at the above address or telephone number.

Appendix I

HCFA Cover Letter to Supplemental Insurers

DEPARTMENT OF HEALTH & HUMAN SERVICES

Health Care Financing Administration

6325 Security Boulevard
Baltimore, MD 21207

JAN 11 1994

Dear Supplemental Insurer:

The Health Care Financing Administration (HCFA) has implemented a 3-year bundled payment demonstration for coronary artery bypass graft surgery, entitled the Medicare Participating Heart Bypass Center demonstration. Hospitals participating in this demonstration receive a bundled payment for all Medicare Part A and Part B services for each Medicare patient receiving a heart bypass graft under DRG 106 or DRG 107. Ohio State University Hospitals in Columbus, Ohio is one of the hospitals selected to participate in this demonstration.

The purpose of this letter is to explain the payment procedures for the Medicare Participating Heart Bypass Center demonstration and minimize the difficulties participating hospitals are having in collecting Medicare coinsurance and deductibles from the beneficiaries' supplemental insurers.

The coinsurance and any deductible amounts listed on the Explanation of Medicare Benefits (EOMB) that are payable under the beneficiary's supplemental insurance coverage should be paid directly to the hospital. Many demonstration claims submitted by the hospitals to supplemental insurers have been refused or the payments were inappropriately made to individual physicians or the beneficiary instead of the hospital. These difficulties appear to be the result of changes in the EOMB format and payment procedures under this demonstration.

Explanation of Billing Process Under the Demonstration

The bundled Medicare payments for DRG 106 and DRG 107 include all hospital and physician services for the hospital admission. Under this demonstration, the hospital submits all hospital and physician bills (Medicare Part A and Part B claims) for each patient discharged under these two DRGs to the Office of Research and Demonstrations (ORD) at HCFA.

After the beneficiary's Medicare eligibility is verified, ORD forwards payment directly to the hospital for each surgical admission. This submission is in lieu of the filing of Part A and some Part B bills to the fiscal intermediary, as well as the filing of Part B physician claims to the Medicare carrier. This payment is all inclusive; individual services are not reviewed for either rate of payment or coverage. The hospital, in turn, makes payments to the appropriate physicians for services performed during each surgical admission.

In addition to collecting any Part A deductible, the hospital, not individual physicians, is responsible for collecting the entire Part B coinsurance amount as well as any Part B deductible owed. The hospital receives an EOMB prepared by ORD stating the total Part B coinsurance amount owed by the beneficiary for the surgical admission. This notice is different in format and content from the carrier- and fiscal intermediary-generated notices. Because of the bundled payment arrangement under this demonstration, this EOMB does not contain detail on procedure codes, amount submitted, amount allowed, or reason for disallowance. It does contain information on the application of Part A and Part B deductibles, and it identifies Part B coinsurance.

Computation of Beneficiary and Supplemental Insurer Liability

ORD has computed one Part B coinsurance amount for each DRG, which is less than what the combined amount would otherwise be for heart bypass surgery performed by these providers outside the demonstration. Thus, the supplemental insurer liability is reduced. In addition, the physicians at each demonstration hospital have agreed to have the hospital collect the coinsurance payments on their behalf.

Under this payment method, only one coinsurance claim is sent by the hospital to the beneficiary or his/her supplemental insurer instead of the multiple claims usually submitted by each physician who provided services during the admission. This coinsurance amount and any deductible amounts listed on the EOMB that are payable under the beneficiary's supplemental insurance coverage should be paid directly to the hospital.

Note that these procedures apply only to hospitals participating in this demonstration, and only to payments for episodes of coronary artery bypass graft surgery at those participating hospitals.

Your cooperation with this important demonstration will facilitate the billing process and help us to better evaluate this bundled payment arrangement. Please contact Ms. Marianne Bayer at HCFA on (410) 966-6558 if you need any further information. Thank you for your cooperation.

Sincerely,

Joseph R. Antos, Ph.D.
Director
Office of Research and Demonstrations

If you have any questions regarding the $596.00 due please contact Ms Bayer at the number above.

Thank You

Appendix J

New England Research Institute Patient Satisfaction Survey

NEW ENGLAND NERI RESEARCH INSTITUTES

DEMONSTRATION SITE
MEDICARE HEART BYPASS PATIENT SATISFACTION SURVEY

October 10, 1996

TELEPHONE INTERVIEW

RESPONDENT ID: | | | | | | |

INTERVIEWER ID | | | |

DATE | | | | | | |

MONTH **DAY** **YEAR**

START TIME | | | : | | | **1. AM** **2. PM**

READ TO ALL RESPONDENTS TO BE INTERVIEWED BY TELEPHONE:

I am calling on behalf of the Health Care Financing Administration which is conducting a study on the quality of health care received by Medicare patients who have recently undergone bypass surgery.

Your participation is voluntary and will not affect your medical care. You may stop the interview at any time and you may refuse to answer any question.

Any information you provide is strictly confidential. For quality assurance, my supervisor may monitor this call. (Your participation will help the medical community advance knowledge about the treatment of heart bypass operations.)

If you have any questions or concerns about the survey, you may call the Field Supervisor, Henry Simpson at ext. 339. If you have questions about your participation as a research subject, you may call Sharyne Donfield of our Institutional Review Board at ext. 239 at New England Research Institutes. Would you like that toll-free number? **[IF RESPONDENT SAYS 'YES':** The toll free telephone number at NERI is (800) 775-6374 and there will be absolutely no charge to you.]

I, (THE INTERVIEWER) HAVE READ THIS STATEMENT TO THE RESPONDENT

INITIALS OF THE INTERVIEWER _____

SECTION A: SELECTION OF CABG DEMONSTRATION FACILITY

A1. First, I would like to confirm that you had heart bypass surgery

in: _____
(MONTH - SEE CONTACT RECORD)

at: _____
(HOSPITAL - SEE CONTACT RECORD)

IF BOTH THE DATE AND HOSPITAL ARE CORRECT, SKIP TO QUESTION A2.

IF THE RESPONDENT INDICATES THAT HE/SHE HAS NOT HAD BYPASS SURGERY, APOLOGIZE FOR THE MIX-UP AND TERMINATE THE CALL. (CIRCLE ERROR CODE.)

1. ERROR CODE

IF THE DATE IS INCORRECT:

A1.a. When did you have your bypass surgery (that time)?

DATE OF SURGERY: ☐☐ **MONTH** ☐☐ **DAY** ☐☐ **YEAR**

PROBE: [Just give your best estimate]

IF THE HOSPITAL IS INCORRECT:

A1.b. Where did you have your bypass surgery?

HOSPITAL NAME: _____

CITY, STATE: _____

A2. Was this your first bypass operation?

1. NO 2. YES → **(SKIP TO QB1.)**

< -8 > DK

↓

A2a. How many bypass surgeries have you had? ☐☐ BYPASS SURGERIES

A3. Did you have your previous bypass surgery, (the one before this), at the same hospital?

1. NO 2. YES ➔ **(SKIP TO QB1)**

< -8 > DK

⬇

A4. Why did you decide to switch hospitals for your most recent bypass surgery?

(RECORD VERBATIM.)

_____

_____

1. SWITCHED DOCTORS; NEW DOCTOR DOES NOT REFER TO PRIOR HOSPITAL(S)
2. ESPECIALLY COMPLICATED CASE -- THIS HOSPITAL/SURGEON WAS RECOMMENDED
3. MOVED AWAY FROM AREA WHERE HOSPITAL(S) LOCATED
4. TOO SICK (EMERGENCY) TO TRAVEL TO PRIOR HOSPITAL(S)
5. NOT SATISFIED WITH QUALITY OF CARE RECEIVED AT PRIOR HOSPITAL
6. OTHER (SPECIFY): _____

SECTION B: HOSPITAL SELECTION

B1. Did you ever consider going to another hospital for your most recent bypass surgery?

1. NO
< -8 > DK
↓
(SKIP TO Q B3)

2. YES
↓

B2. How many other hospitals did you consider besides **(HOSPITAL NAME)**? | | | # HOSPITALS

B2.1. Could you tell me the name and address of each?
(ENTER NAME OF HOSPITAL(S) AND THE CITY AND STATE IN WHICH THEY ARE LOCATED ON LINES PROVIDED.)

(**PROBE**: Any others?)
(PROBE FOR UP TO 3, OR UNTIL # FROM QB2 IS REACHED.)

HOSPITAL 1:

a) HOSPITAL NAME:_____

b) CITY, STATE:_____

B2.2. HOSPITAL 2:

a) HOSPITAL NAME:_____

b) CITY, STATE:_____

B2.3. HOSPITAL 3:

a) HOSPITAL NAME:_____

b) CITY, STATE:_____

B3. Did you know that (**DEMONSTRATION SITE HOSPITAL NAME**) is designated as one of the seven high quality Medicare Heart Bypass Centers nationally performing heart surgery for a single fee covering all hospital and surgeon costs?

1. NO ↓ <-8 > DK ↓

2. YES ↓ B3b. Did this affect your decision to have surgery at the hospital:

   1. A great deal,
   2. A little, or
   3. Not at all

[NOTE: Q B3a IN NON-DEMO SURVEY ONLY]

B3c. How did you hear about the reputation of the hospital you went to? Was it from your;

1. Physician,
2. TV or Radio,
3. Newspapers or Brochures,
4. Family member, or
5. Other? (Please describe)_____

B3d. What do you remember about the information on (**DEMONSTRATION SITE HOSPITAL NAME**)? [PROBE: "What do you remember hearing about the reputation of (**DEMONSTRATION SITE HOSPITAL NAME**)?"]

_____

_____

_____

B4. FOR NON-DEMONSTRATION SITE HOSPITAL RESPONDENTS ONLY.

B5a. Did you talk over which hospital or surgeon to go to with your doctor?

1. NO ↓

2. YES ↓ <-8 > DK ↓ **(SKIP TO Q B5c)**

3. RESPONDENT'S DOCTOR IS THE SURGEON. ↓ **(SKIP TO Q B5c)**

B5b. Why not?

1. EMERGENCY ADMISSION
2. RESPONDENT IS IN AN HMO WITH A DESIGNATED HOSPITAL/(DESIGNATED SURGEON)
3. OTHER (Please specify:) _____

↓

(SKIP TO Q B5d)

B5c. Why did your doctor recommend the hospital you went to?

_____

_____

_____

B5d. How important was the cost of the surgery in choosing the hospital you finally went to?

1. Very important,
2. Somewhat important,
3. Not very important, or you
4. Never considered the cost

SECTION C: IMPORTANCE OF FACTORS INFLUENCING DECISION

Now, I am going to ask you some questions about factors that have been identified as potentially influencing a patient's choice of hospitals. We would like to learn the extent to which they influenced your decision to have your bypass surgery at the hospital you did.

Using a scale from 1 to 5, where 1 is the least influential, 3 is moderately influential, and "5" is the most influential, please tell me how much of a role each factor that I mention played in your decision to have your bypass surgery at **(HOSPITAL NAME)**. If a factor had no influence, please use zero. Do you have any questions?

IF YES, EXPLAIN THE PROCESS AGAIN. IF NO/WHEN RESPONDENT IS READY:
"Okay, Let's begin."

		NO INFLUENCE	THE LEAST INFLUENTIAL	SOMEWHAT INFLUENTIAL	MODERATELY INFLUENTIAL	VERY INFLUENTIAL	THE MOST INFLUENTIAL
C1.	How influential in your choice of hospital was your previous care at the hospital?	0	1	2	3	4	5
C2.	How influential were the recommendations of family and friends?	0	1	2	3	4	5
C3.	How influential was the advice of your doctor who put you in contact with the physicians at the hospital?	0	1	2	3	4	5
C4.	How influential was the package of services offered at the hospital such as assistance with lodging or parking arrangements, or with rehabilitation programs?	0	1	2	3	4	5
C5.	How influential was the location of the hospital?	0	1	2	3	4	5
C6.	How influential was the waiting time for admission to the hospital?	0	1	2	3	4	5
C7.	How influential was the hospital's overall reputation for quality?	0	1	2	3	4	5
C8.	How influential was the hospital's reputation for its heart surgery program?	0	1	2	3	4	5

SECTION D: EXPERIENCE WITH CARE IN THE FACILITY

Now I would like you to rate the quality of the services you received while in the hospital. I am going to read a series of statements. Following each statement, I would like you to use a 5 point scale to rate that aspect of your care where 1 is the worst possible quality, 3 is of average quality, and "5" is the best possible quality. Please give a score of zero if the service was not provided.

The first set of statements have to do with your admission to the hospital. Using the 5 point scale I just described, how would you rate:

		NOT PROVIDED	WORST POSSIBLE QUALITY	FAIR QUALITY	AVERAGE QUALITY	VERY GOOD QUALITY	BEST POSSIBLE QUALITY
D1.	The responsiveness of the nursing staff to your needs?	0	1	2	3	4	5
D2.	The usefulness of the information provided by the nursing staff to yourself, family, and friends regarding tests, treatments, and what you should expect to happen next?	0	1	2	3	4	5
D3.	The overall skill of the nurses who cared for you?	0	1	2	3	4	5
D4.	How attentive the doctors were in taking care of you?	0	1	2	3	4	5
D5.	The overall skill of the doctors who performed your surgery and took care of you while you were in the hospital?	0	1	2	3	4	5
D6.	The provisions made for family and friends; for example, visiting hours, hotels, facilities offered, parking, etc.?	0	1	2	3	4	5
D7.	The plans and information you received regarding your care needs and what you should expect after discharge?	0	1	2	3	4	5

Now I would like to know about the overall quality of care at **(HOSPITAL NAME -- FROM A1 OR A1b).**

D8. Looking back on your care, how would you rate the overall quality of your care and the services you received while in the hospital, using the same scale of 1 to 5, where 1 is the worst possible quality, 3 is of average quality, and "5" is the best possible quality.

1 2 3 4 5

Now I'd like to ask a few more specific questions about your hospital stay:

(CHECK CONTACT RECORD: IS RESPONDENT A DRG 106, OR A DRG 107?)

1. DRG 106

D9. Were you originally admitted to the hospital on an emergency basis?

1. NO 2. YES

2. DRG 107

D10. In what hospital did you have your angiography, catheterization, or diagnostic studies performed? **[INTERVIEWER NOTE: IF MULTIPLE, PROBE FOR MOST RECENT PRIOR TO ADMISSION DATE (ON CONTACT RECORD)]**

HOSPITAL NAME: _____

D10.1. What is the city and state (of that hospital)?

CITY, STATE: _____

D11. How much time passed between your admission for diagnostic tests and your admission to the hospital for bypass surgery?
(RECORD VERBATIM.) _____

NUMBER OF WEEKS ☐☐ **OR NUMBER OF DAYS** ☐☐

PROBE: [Just give your best estimate]

D12. During your bypass stay, how long were you in the hospital before you had your bypass surgery?

(RECORD VERBATIM.) _____

1. SAME DAY AS ADMITTED,

2. ☐☐ DAYS AFTER ADMITTED

D13. How many days were you in the hospital during your bypass stay? ☐☐ DAYS

D14. Did you feel this was:

1. Too many days,
2. About right,
3. A little too short, or
4. Much too short.

→ D14.a. Why? **(RECORD VERBATIM.)** _____

<-8> DK

D15. Did you suffer any of the following complications while you were in the hospital for bypass surgery?

		NO	YES	DK
a.	Required return to the operating room	1	2	<-8>
b.	Infection	1	2	<-8>
c.	Pneumonia	1	2	<-8>
d.	Other lung/breathing problems	1	2	<-8>
e.	Kidney problems/dialysis	1	2	<-8>
f.	Any other complications?	1	2	<-8>

(Please describe: _____)

[INCLUDE UP TO 3 RESPONSES]

D16. Have you been re-admitted to any hospital since you had your bypass surgery on **(DATE FROM A1 OR A1a)**?

1. NO ↓

2. YES ↓

D17. If yes, for what condition were you admitted? **(RECORD VERBATIM.)**

_____

1. NOT HEART RELATED
2. HEART RELATED

9. NOT CLEAR ↓

D17a. What treatment did you receive?

_____

SECTION E: HEALTH STATUS

The next set of questions asks you about your health now.

E1. In general, would you say your overall health now that you have recovered from your bypass surgery is:

1. Excellent,
2. Very Good,
3. Good,
4. Fair, or
5. Poor?

E2. How much difficulty do you have doing your daily work or chores, both inside and outside the house, because of your health?

1. No difficulty at all, ➔**[SKIP TO E3]**

2. A little difficulty,
3. Some difficulty,
4. Much difficulty, or
5. You cannot do them at all

E2a Why? **(RECORD VERBATIM).** _____

1. HEART-RELATED
2. NOT HEART RELATED
9. NOT CLEAR

E3. During the two weeks before you had your bypass surgery on **(DATE FROM A1 OR A1a)**, how much difficulty did you have doing your daily work or recreation or chores, both inside and outside the house, because of your health?

1. No difficulty at all,
2. A little difficulty,
3. Some difficulty,
4. Much difficulty, or
5. You could not them at all

E4. Are there things that you can do now without pain that you could not do before you had your surgery? For example,

		NO	YES	DK	NA (never do activity)
a.	Climbing a flight of stairs	1	2	<-8>	<-1>
b.	Walking 2 or more city blocks	1	2	<-8>	<-1>
c.	Playing golf	1	2	<-8>	<-1>
d.	Playing tennis	1	2	<-8>	<-1>
e.	Swimming	1	2	<-8>	<-1>
f.	Gardening	1	2	<-8>	<-1>
g.	Anything else? **(PROBE: REPEAT QUESTION E4)** (Please specify:_____)	1	2	<-8>	<-1>

Again, using a 5-point scale:

E5. How much were you helped by the surgery and the care you received while in the hospital. Please use a "5" to indicate that the surgery helped you a lot and a 0 to indicate that the surgery did not help you at all.

0 1 2 3 4 5

SECTION F: INSURANCE STATUS

F1. At the time of your hospitalization on **(DATE FROM A1 OR A1a)**, did you have any health insurance in addition to Medicare to help pay Medicare's copayments and deductibles, such as: Blue Cross/Blue Shield or other supplemental insurance?

1. NO 2. YES COMMENT:_____

< -8 > DK

F2. Were you a member of an HMO, (Health Maintenance Organization), at the time of your hospitalization on **(DATE FROM A1 OR A1a)**?

1. NO 2. YES COMMENT:_____

< -8 > DK

SECTION G: BILLING

G1. Did you understand before your admission to the hospital that you would be billed under a different method than Medicare normally uses because you were treated in a Medicare Heart Bypass Center?

1. NO 2. YES

< -8 > DK

G2. How would you rate the ease and efficiency of the billing and payment process for this hospitalization?

1. Easier than you expected,
2. About what you expected, or
3. More difficult than you expected

G3. Could you guess approximately how many separate bills you have received for your bypass surgery--including all hospital and physician bills?

0. NONE
1. ONE
2. TWO
3. THREE TO FIVE
4. SIX TO TEN
5. ELEVEN OR MORE

G4. How did your "out of pocket expenses" compare to what you expected? Were they:

1. Higher than you expected,
2. About what you expected, or
3. Lower than you expected?

SECTION H: DEMOGRAPHICS

Now, I'd like to ask you for some basic information about yourself.

H1. In what year were you born? 1 9 ☐☐

YEAR

H2. Are you:

1. Male, or
2. Female

H3. Would you describe your formal education as:

1. Less than high school,
2. High school graduate,
3. Post high school, or some college, [INCLUDES TRADE SCHOOL]
4. College graduate, or
5. Graduate degree

H4. Do you live alone or with someone else?

1. ALONE
2. WITH SOMEONE ELSE

H5. You may get money from many difference sources, such as social security, interest on savings, and wages you may earn. Would you estimate that your yearly income from all sources is:

1. Less than $15,000
2. $15,000 or more, up to $25,000
3. More than $25,000, up to $50,000, or
4. More than $50,000

SECTION I: REFERRING PHYSICIAN

Finally, I would like to ask you some additional questions so we can follow up with your referring physician regarding your care. (Please note, this must be a physician with whom you made a patient visit):

I.1. What is the name of the physician who put you in contact with the cardiologists or surgeons at **(HOSPITAL NAME FROM A1 OR A1a)** for bypass surgery?

[IF RESPONDENT WAS ADMITTED AS EMERGENCY/OR SAYS NONE, CIRCLE "1 = "NONE".]

PHYSICIAN'S NAME: *(RECORD ON CONTACT RECORD ONLY)* __

1. NONE → **(GO TO END:)** 2. NAME GIVEN

I.2. Is this person your regular physician?

1. NO 2. YES

I.3. What is **(DOCTOR'S NAME FROM QUESTION I.1)** specialty?

_____

I.4. May I have **(DOCTOR'S NAME FROM QUESTION I.1)** complete address and phone number?

STREET ADDRESS: *(RECORD ON CONTACT RECORD ONLY)* _____

HOSPITAL ADDRESS: " _____ "

CITY, STATE: " _____ "

ZIP CODE: " _____ "

PHONE NUMBER: " _____ "

(AREA CODE)

1.) NONE GIVEN 2.) ADDRESS GIVEN

VERIFY RESPONSES TO QUESTIONS I.1, I.2 AND I.3 BEFORE MOVING ON TO NEXT STATEMENT.

END: That concludes my questions. Thank you very much for participating in this survey.

END TIME: [ ][ ] : [ ][ ] 1. AM 2. PM

PLEASE COMPLETE SECTION J.

SECTION J: INTERVIEWER COMMENTS

J1. Please rate how comfortable the Respondent was during the interview.

Not at all comfortable				Very comfortable
1	2	3	4	5

J2. Please rate how cooperative the Respondent was during the interview.

Not at all cooperative				Very cooperative
1	2	3	4	5

J3. In general, how difficult was it for the Respondent to answer the interview questions?

Not at all difficult				Very difficult
1	2	3	4	5

J4. Did the Respondent have difficulty answering any of the questions?

1. NO 2. YES → Which ones? _____
_____

J5. Do you feel that the Respondent gave inaccurate or misleading information on any of the questions?

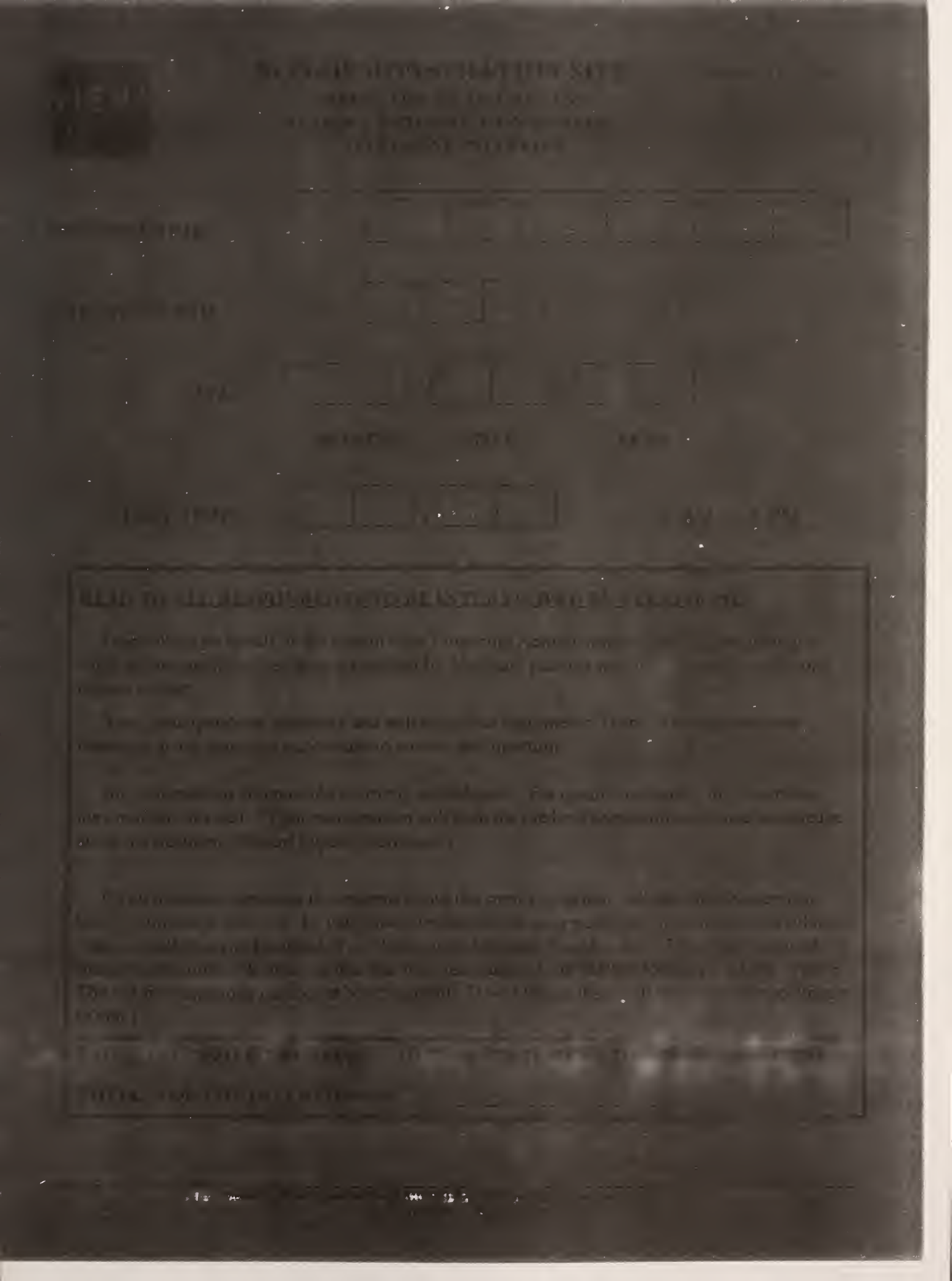
1. NO 2. YES → Which ones? _____
_____

J6. Were there any unusual circumstances at the time of the interview (e.g., R had difficulty hearing, concentrating or there were frequent interruptions, etc.)

1. NO 2. YES → Describe. _____
_____

J7. Did the Respondent have a language or literacy problem?

1. NO 2. YES → Which questions were affected? _____
_____



SECTION A: SELECTION OF CABG DEMONSTRATION FACILITY

A1. First, I would like to confirm that you had heart bypass surgery

in: _____
(MONTH - SEE CONTACT RECORD)

at: _____
(HOSPITAL - SEE CONTACT RECORD)

IF BOTH THE DATE AND HOSPITAL ARE CORRECT, SKIP TO QUESTION A2.

IF THE RESPONDENT INDICATES THAT HE/SHE HAS NOT HAD BYPASS SURGERY, APOLOGIZE FOR THE MIX-UP AND TERMINATE THE CALL. (CIRCLE ERROR CODE.)

1. ERROR CODE

IF THE DATE IS INCORRECT:

A1a. When did you have your bypass surgery (that time)?

DATE OF SURGERY: ☐☐ **MONTH** ☐☐ **DAY** ☐☐ **YEAR**

PROBE: [Just give your best estimate]

IF THE HOSPITAL IS INCORRECT:

A1b. Where did you have your bypass surgery?

HOSPITAL NAME: _____

CITY, STATE: _____

A2. Was this your first bypass operation?

1. NO 2. YES → **(SKIP TO Q B1.)**

< -8 > DK

↓

A2a. How many bypass surgeries have you had? ☐☐ BYPASS SURGERIES

A3. Did you have your previous bypass surgery, (the one before this), at the same hospital?

1. NO 2. YES → **(SKIP TO Q B1)**

< -8 > DK

↓

A4. Why did you decide to switch hospitals for your most recent bypass surgery?

(RECORD VERBATIM.)

_____

_____

1. SWITCHED DOCTORS; NEW DOCTOR DOES NOT REFER TO PRIOR HOSPITAL(S)
2. ESPECIALLY COMPLICATED CASE -- THIS HOSPITAL/SURGEON WAS RECOMMENDED
3. MOVED AWAY FROM AREA WHERE HOSPITAL(S) LOCATED
4. TOO SICK (EMERGENCY) TO TRAVEL TO PRIOR HOSPITAL(S)
5. NOT SATISFIED WITH QUALITY OF CARE RECEIVED AT PRIOR HOSPITAL
6. OTHER (SPECIFY): _____

SECTION B: HOSPITAL SELECTION

B1. Did you ever consider going to another hospital for your most recent bypass surgery?

1. NO
< -8 > DK

(SKIP TO Q B3)

2. YES

B2. How many other hospitals did you consider besides **(HOSPITAL NAME)**? ☐☐ # HOSPITALS

B2.1. Could you tell me the name and address of each?
(ENTER NAME OF HOSPITAL(S) AND THE CITY AND STATE IN WHICH THEY ARE LOCATED ON LINES PROVIDED.)

(**PROBE**: Any others?)
(PROBE FOR UP TO 3, OR UNTIL # FROM QB2 IS REACHED.)

HOSPITAL 1:

a) HOSPITAL NAME:_____

b) CITY, STATE:_____

B2.2. HOSPITAL 2:

a) HOSPITAL NAME:_____

b) CITY, STATE:_____

B2.3. HOSPITAL 3:

a) HOSPITAL NAME:_____

b) CITY, STATE:_____

B3. Did you know that (**DEMONSTRATION SITE HOSPITAL NAME**) is designated as one of the seven high quality Medicare Heart Bypass Centers nationally performing heart surgery for a single fee covering all hospital and surgeon costs?

1. NO
2. YES

< -8 > DK

B3a. If you had known it was a Medicare Heart Bypass Center, do you think you would have been:

1. Much more likely to go there
2. A little more likely to go there
3. Would not have made a difference, or
4. Less likely to go there

[NOTE: QB3b IN DEMO SURVEY ONLY]

B3c. How did you hear about the reputation of the hospital you went to? Was it from your:

1. Physician,
2. Tv or Radio,
3. Newspapers, or Brochures,
4. Family Members, or
5. Other: (Please Describe) _____

B3d. What do you remember about the information on the hospital you went to?
[**PROBE**: "What do you remember hearing about the reputation of (**HOSPITAL NAME**)?"]

_____

B4. Why didn't you decide to go to (**DEMONSTRATION SITE HOSPITAL NAME**) for your surgery? **(RECORD VERBATIM.)**

_____

IF RESPONDENT LISTS MORE THAN ONE RESPONSE, PROBE: Could you please rank your responses in order of their importance?

1. PHYSICIAN PREFERRED OTHER HOSPITAL. (**PROBE:** Why?) **(RECORD VERBATIM.)** _____ _____
2. LIMITED REPUTATION OF HEART SURGERY PROGRAM/ HEART SURGEONS _____
3. HOSPITAL'S OVERALL REPUTATION _____
4. HOSPITAL TOO FAR AWAY _____
5. HMO/INSURANCE RESTRICTIONS _____
6. FAMILY/FRIEND RECOMMENDATIONS _____
7. PREVIOUS PERSONAL EXPERIENCE WITH HOSPITAL _____
8. JUST NEVER CONSIDERED IT _____
9. OTHER (Specify): _____

B4.1. Did you know **(DEMONSTRATION SITE HOSPITAL NAME)** did heart surgery?

1. NO 2. YES

B5a. Did you talk over which hospital or surgeon to go to with your doctor?

1. NO	2. YES	3. RESPONDENT'S DOCTOR IS THE SURGEON.	< -8 > DK
↓	↓	↓	↓
	(SKIP TO Q B5c)	**(SKIP TO Q B5c)**	**(SKIP TO Q B5c)**

B5b. Why not?

1. EMERGENCY ADMISSION
2. RESPONDENT IS IN AN HMO WITH A DESIGNATED HOSPITAL/(DESIGNATED SURGEON)
3. OTHER (Please specify:) _____

↓

(SKIP TO QB5d)

B5c. Why did your doctor recommend the hospital you went to? _____

_____

B5d. How important was the cost of the surgery in choosing the hospital you finally went to?

1. Very important,
2. Somewhat important,
3. Not very important, or you
4. Never considered the cost

SECTION C: IMPORTANCE OF FACTORS INFLUENCING DECISION

Now, I am going to ask you some questions about factors that have been identified as potentially influencing a patient's choice of hospitals. We would like to learn the extent to which they influenced your decision to have your bypass surgery at the hospital you did.

Using a scale from 1 to 5, where 1 is the least influential, 3 is moderately influential, and "5" is the most influential, please tell me how much of a role each factor that I mention played in your decision to have your bypass surgery at **(HOSPITAL NAME)**. If a factor had no influence, please use zero. Do you have any questions?

IF YES, EXPLAIN THE PROCESS AGAIN. IF NO/WHEN RESPONDENT IS READY:
"Okay, Let's begin."

		NO INFLUENCE	THE LEAST INFLUENTIAL	SOMEWHAT INFLUENTIAL	MODERATELY INFLUENTIAL	VERY INFLUENTIAL	THE MOST INFLUENTIAL
C1.	How influential in your choice of hospital was your previous care at the hospital?	0	1	2	3	4	5
C2.	How influential were the recommendations of family and friends?	0	1	2	3	4	5
C3.	How influential was the advice of your doctor who put you in contact with the physicians at the hospital?	0	1	2	3	4	5
C4.	How influential was the package of services offered at the hospital such as assistance with lodging or parking arrangements, or with rehabilitation programs?	0	1	2	3	4	5
C5.	How influential was the location of the hospital?	0	1	2	3	4	5
C6.	How influential was the waiting time for admission to the hospital?	0	1	2	3	4	5
C7.	How influential was the hospital's overall reputation for quality?	0	1	2	3	4	5
C8.	How influential was the hospital's reputation for its heart surgery program?	0	1	2	3	4	5

SECTION D: EXPERIENCE WITH CARE IN THE FACILITY

Now I would like you to rate the quality of the services you received while in the hospital. I am going to read a series of statements. Following each statement, I would like you to use a 5 point scale to rate that aspect of your care where 1 is the worst possible quality, 3 is of average quality, and "5" is the best possible quality. Please give a score of zero if the service was not provided.

The first set of statements have to do with your admission to the hospital. Using the 5 point scale I just described, how would you rate:

		NOT PROVIDED	WORST POSSIBLE QUALITY	FAIR QUALITY	AVERAGE QUALITY	VERY GOOD QUALITY	BEST POSSIBLE QUALITY
D1.	The responsiveness of the nursing staff to your needs?	0	1	2	3	4	5
D2.	The usefulness of the information provided by the nursing staff to yourself, family, and friends regarding tests, treatments, and what you should expect to happen next?	0	1	2	3	4	5
D3.	The overall skill of the nurses who cared for you?	0	1	2	3	4	5
D4.	How attentive the doctors were in taking care of you?	0	1	2	3	4	5
D5.	The overall skill of the doctors who performed your surgery and took care of you while you were in the hospital?	0	1	2	3	4	5
D6.	The provisions made for family and friends; for example, visiting hours, hotels, facilities offered, parking, etc.?	0	1	2	3	4	5
D7.	The plans and information you received regarding your care needs and what you should expect after discharge?	0	1	2	3	4	5

Now I would like to know about the overall quality of care at **(HOSPITAL NAME -- FROM A1 OR A1b).**

D8. Looking back on your care, how would you rate the overall quality of your care and the services you received while in the hospital, using the same scale of 1 to 5, where 1 is the worst possible quality, 3 is of average quality, and "5" is the best possible quality.

1 2 3 4 5

Now I'd like to ask a few more specific questions about your hospital stay:
[CHECK CONTACT RECORD: IS RESPONDENT A DRG 106, OR A DRG 107?]

1. DRG 106 ↓

D9. Were you originally admitted to the hospital on an emergency basis?

1. NO 2. YES

2. DRG 107 ↓

D10. In what hospital did you have your angiography, catheterization, or diagnostic studies performed? **[INTERVIEWER NOTE: IF MULTIPLE, PROBE FOR MOST RECENT PRIOR TO ADMISSION DATE (ON CONTACT RECORD)]**

HOSPITAL NAME: _____

D10.1. What is the city and state (of that hospital)?

CITY, STATE: _____ ↓

D11. How much time passed between your admission for diagnostic tests and your admission to the hospital for bypass surgery?
(RECORD VERBATIM.) _____

NUMBER OF WEEKS ☐☐ **OR NUMBER OF DAYS** ☐☐
[PROBE: Just give your best estimate]

D12. During your bypass stay, how long were you in the hospital before you had your bypass surgery?

(RECORD VERBATIM.) _____

1. SAME DAY AS ADMITTED,

2. ☐☐ DAYS AFTER ADMITTED

D13. How many days were you in the hospital during your bypass stay? ☐☐ DAYS

D14. Did you feel this was:

1. Too many days,
2. About right,
3. A little too short, or
4. Much too short.

→ D14.a. Why? **(RECORD VERBATIM.)**

_____

_____

<-8> DK

D15. Did you suffer any of the following complications while you were in the hospital for bypass surgery?

		NO	YES	DK
a.	Required return to the operating room	1	2	<-8>
b.	Infection	1	2	<-8>
c.	Pneumonia	1	2	<-8>
d.	Other lung/breathing problems	1	2	<-8>
e.	Kidney problems/dialysis	1	2	<-8>
f.	Any other complications?	1	2	<-8>

(Please describe:_____)

[INCLUDE UP TO 3 RESPONSES]

D16. Have you been re-admitted to any hospital since you had your bypass surgery on **(DATE FROM A1 OR A1a)**?

1. NO ↓

2. YES ↓

D17. If yes, for what condition were you admitted? **(RECORD VERBATIM.)**

_____

1. NOT HEART RELATED
2. HEART RELATED ↓

9. NOT CLEAR ↓

D17a. What treatment did you receive?

_____

SECTION E: HEALTH STATUS

The next set of questions asks you about your health now.

E1. In general, would you say your overall health now that you have recovered from your bypass surgery is:

1. Excellent,
2. Very Good,
3. Good,
4. Fair, or
5. Poor?

E2. How much difficulty do you have doing your daily work or chores, both inside and outside the house, because of your health?

1. No difficulty at all, ➔**[SKIP TO E3]**

2. A little difficulty,
3. Some difficulty,
4. Much difficulty, or
5. You cannot do them at all

E2a Why? **(RECORD VERBATIM).** _____

1. HEART-RELATED
2. NOT HEART RELATED
9. NOT CLEAR

E3. During the two weeks before you had your bypass surgery on **(DATE FROM A1 OR A1a)**, how much difficulty did you have doing your daily work or recreation or chores, both inside and outside the house, because of your health?

1. No difficulty at all,
2. A little difficulty,
3. Some difficulty,
4. Much difficulty, or
5. You could not them at all

E4. Are there things that you can do now without pain that you could not do before you had your surgery? For example,

		NO	YES	DK	NA (never do activity)
a.	Climbing a flight of stairs	1	2	<-8>	<-1>
b.	Walking 2 or more city blocks	1	2	<-8>	<-1>
c.	Playing golf	1	2	<-8>	<-1>
d.	Playing tennis	1	2	<-8>	<-1>
e.	Swimming	1	2	<-8>	<-1>
f.	Gardening	1	2	<-8>	<-1>
g.	Anything else? **(PROBE: REPEAT QUESTION E4)** (Please specify:_____)	1	2	<-8>	<-1>

Again, using a 5 point scale:

E5. How much were you helped by the surgery and the care you received while in the hospital. Please use a "5" to indicate that the surgery helped you a lot and a 0 to indicate that the surgery did not help you at all.

0 1 2 3 4 5

SECTION F: INSURANCE STATUS

F1. At the time of your hospitalization on **(DATE FROM A1 OR A1a)**, did you have any health insurance in addition to Medicare to help pay Medicare's copayments and deductibles, such as: Blue Cross/Blue Shield or other supplemental insurance?

1. NO 2. YES COMMENT:_____

< -8 > DK

F2. Were you a member of an HMO, (Health Maintenance Organization), at the time of your hospitalization on **(DATE FROM A1 OR A1a)**?

1. NO 2. YES COMMENT:_____

< -8 > DK

SECTION G: BILLING

G1. **FOR DEMONSTRATION SITE HOSPITAL RESPONDENTS ONLY.**

FOR ALL PATIENTS:

G2. How would you rate the ease and efficiency of the billing and payment process for this hospitalization?

1. Easier than you expected,
2. About what you expected, or
3. More difficult than you expected

G3. Could you guess approximately how many separate bills you have received for your bypass surgery--including all hospital and physician bills?

0. NONE
1. ONE
2. TWO
3. THREE TO FIVE
4. SIX TO TEN
5. ELEVEN OR MORE

G4. How did your "out of pocket expenses" compare to what you expected? Were they:

1. Higher than you expected,
2. About what you expected, or
3. Lower than you expected?

SECTION H: DEMOGRAPHICS

Now, I'd like to ask you for some basic information about yourself.

H1. In what year were you born? 1 9 [ ][ ]
YEAR

H2. Are you:

1. Male, or
2. Female

H3. Would you describe your formal education as:

1. Less than high school,
2. High school graduate,
3. Post high school, or some college, [INCLUDES TRADE SCHOOL]
4. College graduate, or
5. Graduate degree

H4. Do you live alone or with someone else?

1. ALONE
2. WITH SOMEONE ELSE

H5. You may get money from many difference sources, such as social security, interest on savings, and wages you may earn. Would you estimate that your yearly income from all sources is:

1. Less than $15,000
2. $15,000 or more, up to $25,000
3. More than $25,000, up to $50,000, or
4. More than $50,000

SECTION I: REFERRING PHYSICIAN

Finally, I would like to ask you some additional questions so we can follow up with your referring physician regarding your care. (Please note, this must be a physician with whom you made a patient visit):

I.1. What is the name of the physician who put you in contact with the cardiologists or surgeons at **(HOSPITAL NAME FROM A1 OR A1a)** for bypass surgery?

[IF RESPONDENT WAS ADMITTED AS EMERGENCY/OR SAYS NONE, CIRCLE "1 = "NONE".]

PHYSICIAN'S NAME: *(RECORD ON CONTACT RECORD ONLY)* __

1. NONE → **(GO TO END:)** 2. NAME GIVEN

I.2. Is this person your regular physician?

1. NO 2. YES

I.3. What is **(DOCTOR'S NAME FROM QUESTION I.1)** specialty?

_____

I.4. May I have **(DOCTOR'S NAME FROM QUESTION I.1)** complete address and phone number?

STREET ADDRESS: *(RECORD ON CONTACT RECORD ONLY)* _____

HOSPITAL ADDRESS: " _____ "

CITY, STATE: " _____ "

ZIP CODE: " _____ "

PHONE NUMBER: " _____ "

(AREA CODE)

1.) NONE GIVEN 2.) ADDRESS GIVEN

VERIFY RESPONSES TO QUESTIONS I.1, I.2 AND I.3 BEFORE MOVING ON TO NEXT STATEMENT.

END: That concludes my questions. Thank you very much for participating in this survey.

END TIME: [ ][ ] : [ ][ ] 1. AM 2. PM

PLEASE COMPLETE SECTION J.

SECTION J: INTERVIEWER COMMENTS

J1. Please rate how comfortable the Respondent was during the interview.

Not at all comfortable				Very comfortable
1	2	3	4	5

J2. Please rate how cooperative the Respondent was during the interview.

Not at all cooperative				Very cooperative
1	2	3	4	5

J3. In general, how difficult was it for the Respondent to answer the interview questions?

Not at all difficult				Very difficult
1	2	3	4	5

J4. Did the Respondent have difficulty answering any of the questions?

1. NO 2. YES → Which ones? _____
_____

J5. Do you feel that the Respondent gave inaccurate or misleading information on any of the questions?

1. NO 2. YES → Which ones? _____
_____

J6. Were there any unusual circumstances at the time of the interview (e.g., R had difficulty hearing, concentrating or there were frequent interruptions, etc.)

1. NO 2. YES → Describe. _____
_____

J7. Did the Respondent have a language or literacy problem?

1. NO 2. YES → Which questions were affected? _____
_____

Appendix K

New England Research Institute Referring Physician Survey

NEW ENGLAND NERI RESEARCH INSTITUTES

MEDICARE HEART BYPASS DEMONSTRATION PROJECT
PROVIDER SURVEY

February 10, 1997

RESPONDENT ID: [ ][ ][ ]

INTERVIEWER ID [ ][ ][ ]

DATE [ ][ ] [ ][ ] [ ][ ]

MONTH DAY YEAR

START TIME [ ][ ] : [ ][ ] 1. AM 2. PM

INTRODUCTION

We are surveying physicians whose patients have undergone heart bypass surgery at one of the hospitals in your area. (**DEMONSTRATION SITE HOSPITAL**) is one of 7 hospitals participating in the Medicare Heart Bypass Demonstration Project. We are interested in learning about the experience of physicians and Medicare beneficiaries at different hospitals in your area.

(PATIENT'S NAME) referred us to you as the physician who sent him/her to (PATIENT HOSPITAL NAME FROM CONTACT RECORD).

This survey is part of a broader evaluation of the new way of paying for bypass surgery that bundles all inpatient services into a single bill.

We would like to know more about:

- Your referral patterns and the factors that influence your decision to refer patients to a particular hospital,
- Your knowledge of the Medicare Heart Bypass Center at (**DEMONSTRATION SITE**).
- How you rate the quality of hospital services and the care that patients receive.

READ TO ALL RESPONDENTS TO BE INTERVIEWED BY TELEPHONE:

Before we begin let me remind you that all information is strictly confidential. Only project staff will see or hear your responses. For quality assurance, my supervisor may monitor this call. (Your participation will help the medical community advance knowledge about the treatment of heart bypass operations.)

If you have any questions or concerns about the survey, you may call the Field Supervisor, Henry Simpson at ext. 339. If you have questions about your participation as a research subject, you may call Sharyne Donfield of our Institutional Review Board at ext. 239 at New England Research Institutes. Would you like that toll-free number? [**IF RESPONDENT SAYS 'YES':** The toll free telephone number at NERI is (800) 775-6374 and there will be absolutely no charge to you.]

I, (THE INTERVIEWER) HAVE READ THIS STATEMENT TO THE RESPONDENT

INITIALS OF THE INTERVIEWER _____

SECTION A: RESPONDENT IDENTIFICATION/BACKGROUND

A1. Before we begin, I would like to verify that I have your correct address. [SEE CONTACT RECORD.]

[VERIFY INFORMATION ON CONTACT RECORD. VERIFY AND FILL IN MISSING CITY, STATE, AND ZIP CODE INFORMATION.]

[ENTER INFORMATION ON CONTACT RECORD.]

NAME: _____

ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

TELEPHONE: ( ) _____

A2. What is your practice specialty?

[NOTE: USE CATEGORIES BELOW AS "PROMPTS" IF NEEDED.]

1. Cardiology
2. General Internal Medicine
3. Internal Medicine with Subspecialty
4. Gerontology
5. Family Practice
6. Other (Specify:)

_____

SECTION B: REFERRAL PRACTICES

B1. To which hospitals in *(**DEMONSTRATION CITY**) do you regularly refer patients for cardiac evaluation or possible revascularization?

[ENTER EACH HOSPITAL NAMED BY THE PHYSICIAN IN THE SPACE PROVIDED BELOW.] ***NOTE: LIST MAY INCLUDE HOSPITALS IN THE DOCTOR'S "REFERRAL AREA."***

B2.----------->**FOR EACH HOSPITAL MENTIONED, ASK "B2":**

		B2. Do you have admitting privileges there?	
		NO	YES
1.	_____	1	2
2.	_____	1	2
3.	_____	1	2
4.	_____	1	2

B3. Of the hospitals you just listed, which is the **primary** recipient of your referrals for cardiac revascularization? **[NOTE: REVASCULARIZATION = CABG OR ANGIOPLASTY.]**

_____

B4. How long have you been referring patients to (**HOSPITAL NAMED IN Q B3**)?

			OR			
		MONTHS				YEARS

B5. Would you please estimate the number of referrals you make, on average, to this hospital for possible revascularization per month or per year, whichever is easier for you to estimate.

			OR			
		(#) per MONTH				(#) per YEAR

[IF DOCTOR MENTIONED (DEMONSTRATION SITE HOSPITAL) AS A RECIPIENT OF HIS/HER REFERRALS IN RESPONSE TO Q#B1 ABOVE, SKIP TO Q#B7.]

[IF DOCTOR DID NOT MENTION (DEMONSTRATION SITE HOSPITAL) AS A RECIPIENT OF HIS/HER REFERRALS IN RESPONSE TO Q#B1 ABOVE, CONTINUE.]

[NOTE: ***DEMONSTRATION CITY**: SITE 1 = BOSTON; SITE 2 = ATLANTA; SITE 3 = ANN ARBOR;
SITE 4 = COLUMBUS; SITE 5 = HOUSTON;
SITE 6 = PORTLAND; SITE 7 = INDIANAPOLIS]

B6. Have you ever regularly referred cardiac patients to **(DEMONSTRATION SITE HOSPITAL)**?

1. NO--> B6.1 Why haven't you?_____

_____

<---------- GO TO Q#C1----------->

2. YES--> B6.2 Why did you stop?_____

[LEAVE QUESTION OPEN ENDED. USE THE LIST BELOW AS A PROMPT WHEN NECESSARY.]

1. Quality of patient care
2. Accessibility (ease of getting into and out of hospital)
3. Patient willingness to use hospital
4. Technical competence of doctors
5. Location of Hospital
6. Does not have admitting privileges, can't follow patient in hospital
7. Hospital's reputation within medical community
8. Other **(Specify:)**

_____

FOR ALL: GO TO Q#C1.

B7. Please estimate the **total** number of referrals for possible (cardiac) revascularization that you made to the **(DEMONSTRATION SITE HOSPITAL)** in the last month or year, whichever is easier for you to estimate.

		(#) PER MONTH	**OR**		(#) PER YEAR

B8. Comparing this year to previous years, would you say that you referred more, fewer, or about the same number of patients to **(DEMONSTRATION SITE HOSPITAL)** for possible (cardiac) revascularization?

1. MORE ↓
2. FEWER ↓
3. ABOUT THE SAME ↓

GO TO Q#B9.

B8.1 To what do you attribute this change?

_____

_____

B9. Which patient symptoms or characteristics might cause you to refer your cardiac patients to one hospital over another in the area?

[LEAVE QUESTION OPEN-ENDED. PHYSICIAN MAY RESPOND WITH MULTIPLE ANSWERS. IF RESPONSE IS NOT ONE OF THE FOLLOWING, THEN ENTER THE RESPONSE UNDER "OTHER"]

1. Patient had previous bypass (surgery)
2. Patient age (elderly)
3. Patient has other conditions such as diabetes, bad kidneys
4. Patient likely to need multiple bypasses
5. Refer all patients to same hospital
6. Makes no difference: insurance coverage, nonclinical factors drive the decision
7. Other **(SPECIFY UP TO 3 REASONS:)**

(a.) _____

(b.) _____

(c.) _____

B10. Are you inclined to refer your more severely ill or your less severely ill cardiac patients to **(DEMONSTRATION SITE HOSPITAL)** for possible (cardiac) revascularization?

1. MD. REFERS PATIENTS WITH MORE <u>SEVERELY ILL</u> CASES TO **DEMONSTRATION SITE HOSPITAL**
2. MD. REFERS PATIENTS WITH **LESS** <u>SEVERELY ILL</u> CASES TO **DEMONSTRATION SITE HOSPITAL**
3. MD. MAKES NO DISTINCTIONS IN REFERRALS TO **DEMONSTRATION SITE HOSPITAL**

SECTION C: AWARENESS OF THE DEMONSTRATION

C1. Are you aware that **(DEMONSTRATION SITE HOSPITAL)** is a participant in the Medicare Heart Bypass Project?

1. NO → **GO TO Q#D1.**
2. YES →

C2. How did you learn about the Medicare Heart Bypass Project at **(DEMONSTRATION SITE HOSPITAL)**?

[LEAVE QUESTION OPEN-ENDED. IF RESPONSE IS NOT ONE OF THE FOLLOWING, THEN ENTER THE RESPONSE UNDER "OTHER". IF RESPONDENT IS HAVING DIFFICULTY RECALLING, PROMPT WITH THE ITEMS ON THE LIST BELOW.]

1. Direct mail (e.g., a brochure about the hospital or the Heart Bypass Project sent to your office) **[NOTE: THIS DOES NOT INCLUDE NERI/HCFA LETTER]**
2. Hospital presentation (e.g., presentation by a hospital physician or administrator at your office or at a meeting of your colleagues)
3. Hospital publication (e.g., physician newsletter or hospital bulletin)
4. Other health publication (e.g. medical or trade journal)
5. TV/Radio Program/Advertisement
6. Other News Media **(Please specify:)**

   _____
7. Colleague
8. Other **(Please specify:) [NOTE: IF MD. MENTIONS NERI/HCFA LETTER, INCLUDE BELOW.]**

   _____

C3. Did your referral pattern to **(DEMONSTRATION SITE HOSPITAL)** for possible (cardiac) revascularizations change during the past 2 to 3 years because of information you received about the Heart Bypass Project?

1. NO → **GO TO SECTION D.**
2. YES →

C4. In what way did it change?

[LEAVE OPEN-ENDED. "PROMPT" AS NEEDED USING THE LIST BELOW.]

1. Started referring to (**DEMONSTRATION SITE HOSPITAL**)
2. Increased referrals
3. Decreased referrals
4. Stopped referring
5. Other **(Please specify:)**

   _____

6. Other **(Please specify:)**

   _____

SECTION D: FACTORS INFLUENCING REFERRAL DECISIONS

D1. You have a choice of several well-known heart hospitals in (*DEMONSTRATION CITY) where you can refer patients.

**In the last few months, what percentage of the patients you referred for possible revascularization:*
[NOTE: * = READ STEM]

D1.1 *Were influenced in choice of hospital by lack of insurance or inability to pay out-of-pocket expenses?

			%

D1.2 *Were limited in choice of hospital because their insurance restricted the hospitals they could use?

			%

D1.3 (What percentage...) expressed a strong preference for some hospital based on a factor such as their prior experiences, perception of quality or the hospital location?

			%

D1.4 (What percentage...) had some condition such as a previous bypass that you felt was best handled in one local hospital rather than another?

			%

D1.5 (What percentage...) were affected by scheduling difficulties or waiting times in choosing a hospital?

			%

[NOTE: THESE PERCENTAGES *NEED NOT* TOTAL 100%.]

[NOTE: ***DEMONSTRATION CITY**: SITE 1 = BOSTON; SITE 2 = ATLANTA; SITE 3 = ANN ARBOR;
SITE 4 = COLUMBUS; SITE 5 = HOUSTON;
SITE 6 = PORTLAND; SITE 7 = INDIANAPOLIS]

[NOTE: *INTERVIEWER PROBE: SUBSTITUTE "your area" for DEMONSTRATION CITY]

Now I am going to read a list of factors that may influence your choice of hospital for possible (cardiac) revascularizations. Using a scale of 1 to 5, where "1" is the least influential, "3" is moderately influential, and "5" is the most influential, please rate the influence of each of the following factors in terms of your referral decisions. If a factor has no influence, please use zero.

Do you have any questions? **[IF YES, ANSWER THEM.]**
[IF NO:] "OK, let's begin.

D2. On a scale of 1 to 5, how influential are your relationships with hospital staff and doctors, particularly the cardiologists and surgeons, in your referral decision?

0 1 2 3 4 5

D3. How influential is the hospital's overall reputation?

0 1 2 3 4 5

D4. How influential is the hospital's demonstrated superiority of surgical outcomes?

0 1 2 3 4 5

D5. How influential are special programs and services the hospital offers its referring physicians, such as special educational opportunities, free parking, telephone-based cardiac consultation programs, or expedited patient scheduling?

0 1 2 3 4 5

D6. How influential are the frequency and quality of communications you receive from the hospital regarding your patients care?

0 1 2 3 4 5

D7. How influential are special services the hospital offers to patients and their families, such as assistance with lodging and parking arrangements, or programs such as cardiac rehabilitation?

0 1 2 3 4 5

INTERVIEWER NOTE:

[IF DOCTOR RESPONDED "NO" AT Q#B6, SKIP TO "PHYSICIAN SATISFACTION-OTHER HOSPITALS, SECTION F; PAGE 13 . FOR ALL OTHER DOCTORS, (*INCLUDING THOSE FOR WHOM Q#B6 WAS SKIPPED*), PLEASE CONTINUE TO SECTION E.]

SECTION E: PHYSICIAN SATISFACTION -- DEMONSTRATION SITE HOSPITAL

One of the purposes of this interview is to find out how physicians who referred patients to **(DEMONSTRATION SITE HOSPITAL)** for possible (cardiac) revascularizations would rate the services provided both to them and to their patients. The next set of questions is about your satisfaction with several aspects of patient care at the hospital.

I would like you to rate each of these aspects using a scale of 1 to 5, where "1" is the least satisfied, "3" is moderately satisfied, and "5" is the most satisfied. If you have no opinion regarding an item, please use zero.

E1. How would you rate the overall quality of the care provided at **(DEMONSTRATION SITE HOSPITAL)**?

0 1 2 3 4 5

E2. How would you rate the technical sophistication and overall quality of the cardiac care your patients receive from the doctors while in the hospital?

0 1 2 3 4 5

E3. How would you rate the overall skill, qualifications, and responsiveness of the nursing staff caring for heart bypass patients?

0 1 2 3 4 5

E4. How would you rate special programs and services **(DEMONSTRATION SITE HOSPITAL)** offers patients, such as cardiac rehabilitation, information and educational materials, or assistance with parking and lodging?

0 1 2 3 4 5

E5. How would you rate special programs and services the hospital offers its referring physicians, such as special educational opportunities, free parking, telephone-based cardiac consultation programs, or expedited patient scheduling?

0 1 2 3 4 5

E6. How would you rate the ease of scheduling patients for diagnostic procedures, laboratory tests, or surgery at **(DEMONSTRATION SITE HOSPITAL)**?

0 1 2 3 4 5

E7. How would you rate the information you received upon admission, during the stay, and after discharge about the services and care provided to your cardiac patients at (DEMONSTRATION SITE HOSPITAL)?

0 1 2 3 4 5

[NOTE: IF DR. ALSO WAS REFERRED BY A PATIENT FROM A NON-DEMONSTRATION SITE HOSPITAL, *(OR IF DOCTOR REFUSED TO ANSWER SECTION E)* GO TO SECTION F; PAGE 13.

This completes the survey. Thank you for your help with this important research.

END TIME | | | : | | | 1. AM 2. PM

PLEASE COMPLETE SECTION G.

SECTION F: PHYSICIAN SATISFACTION -- OTHER HOSPITAL

One of the purposes of this interview is to find out how physicians who referred patients to **(OTHER HOSPITAL NAME FROM Q#B3)** for possible (cardiac) revascularizations would rate the services provided both to them and to their patients. The next set of questions is about your satisfaction with several aspects of patient care the hospital.

I would like you to rate each of these aspects using a scale of 1 to 5, where "1" is the least satisfied, "3" is moderately satisfied, and "5" is the most satisfied. If you have no opinion regarding an item, please use zero.

F1. How would you rate the overall quality of the care provided at **(OTHER HOSPITAL NAME)**?

0 **1** **2** **3** **4** **5**

F2. How would you rate the technical sophistication and overall quality of the cardiac care your patients receive from the doctors while in the hospital?

0 **1** **2** **3** **4** **5**

F3. How would you rate the overall skill, qualifications, and responsiveness of the nursing staff caring for heart bypass patients?

0 **1** **2** **3** **4** **5**

F4. How would you rate special programs and services **(OTHER HOSPITAL NAME)** offers patients, such as cardiac rehabilitation, information and educational materials, or assistance with parking and lodging?

0 **1** **2** **3** **4** **5**

F5. How would you rate special programs and services the hospital offers its referring physicians, such as special educational opportunities, free parking, telephone-based cardiac consultation programs, or expedited patient scheduling?

0 **1** **2** **3** **4** **5**

F6. How would you rate the ease of scheduling patients for diagnostic procedures, laboratory tests, or surgery at **(OTHER HOSPITAL NAME)**?

0 **1** **2** **3** **4** **5**

F7. How would you rate the information you received upon admission, during the stay, and after discharge about the services and care provided to your cardiac patients at (OTHER HOSPITAL NAME)?

0 1 2 3 4 5

This completes the survey. Thank you for your help with this important research.

END TIME [ ][ ] : [ ][ ] 1. AM 2. PM

PLEASE COMPLETE SECTION G.

SECTION G: INTERVIEWER COMMENTS

G1. Please rate how comfortable the Respondent was during the interview.

Not at all comfortable				Very comfortable
1	2	3	4	5

G2. Please rate how cooperative the Respondent was during the interview.

Not at all cooperative				Very cooperative
1	2	3	4	5

G3. In general, how difficult was it for the Respondent to answer the interview questions?

Not at all difficult				Very difficult
1	2	3	4	5

G4. Did the Respondent have difficulty answering any of the questions?

1. NO 2. YES → Which ones? _____
_____

G5. Do you feel that the Respondent gave inaccurate or misleading information on any of the questions?

1. NO 2. YES → Which ones? _____
_____

G6. Were there any unusual circumstances at the time of the interview (e.g., R had difficulty hearing, concentrating or there were frequent interruptions, etc.)

1. NO 2. YES → Please describe: _____
_____

G7. Did the Respondent have a language or literacy problem?

1. NO 2. YES → Which questions were affected? _____
_____

Appendix L

Miscellaneous Tables

Table L-4-1

Medicare Angioplasty Volumes and Market Shares for Demonstration Hospitals and Their Competitors

	1990		1991		1992		1993		1994		1995		1996	
	Medicare PTCAs	Market Share	Medicare PTCAs	Market Share	Medicare PTCAs	Market Share	Medicare PTCAs	Market Share	Medicare PTCAs	Market Share	Medicare PTCAs	Market Share	Medicare PTCAs	Market Share
Atlanta														
Saint Joseph's	**658**	**35.2**	**892**	**41.4**	**1,134**	**44.3**	**1,197**	**45.1**	**1,062**	**42.7**	**1,121**	**40.7**	**1,197**	**42.1**
Emory University	693	37.1	704	32.7	719	28.1	687	25.9	667	26.8	708	25.7	708	**24.9**
Crawford Long	169	9.1	203	9.4	262	10.2	243	9.2	262	10.5	344	12.5	355	**12.5**
Grady Memorial	0	0.0	18	0.8	0	0.0	19	0.7	16	0.6	14	0.5	0	**0.0**
Piedmont	98	5.2	123	5.7	186	7.3	288	10.9	328	13.2	459	16.7	486	**17.1**
Georgia Baptist	249	13.3	213	9.9	260	10.2	219	8.3	152	6.1	106	3.9	100	**3.5**
Total	1,867	100.0	2,153	100.0	2,561	100.0	2,653	100.0	2,487	100.0	2,752	100.0	2,846	**100.0**
Boston														
University Hospital	**194**	**12.4**	**175**	**9.1**	**229**	**9.7**	**267**	**10.8**	**277**	**10.6**	**328**	**11.0**	276	9.7
Mount Auburn	77	4.9	54	2.8	77	3.3	81	3.3	89	3.4	118	3.9	96	**3.4**
St. Elizabeth's	115	7.4	106	5.5	159	6.7	137	5.6	117	4.5	178	5.9	136	**4.8**
Massachusetts General	249	16.0	286	14.9	316	13.4	396	16.1	454	17.4	407	13.6	411	**14.5**
Beth Israel	231	14.8	269	14.0	269	11.4	261	10.6	305	11.7	401	13.4	516	**18.2**
Brigham & Women's	107	6.9	157	8.2	167	7.1	170	6.9	154	5.9	201	6.7	203	**7.2**
New England Medical Center	71	4.5	106	5.5	153	6.5	167	6.8	162	6.2	206	6.9	124	**4.4**
New England Deaconess	311	19.9	423	22.1	487	20.6	440	17.9	416	16.0	502	16.8	294	**10.4**
Lahey Clinic	21	1.3	81	4.2	193	8.2	228	9.3	302	11.6	248	8.3	345	**12.2**
Catholic Memorial	185	11.9	260	13.6	309	13.1	314	12.8	329	12.6	405	13.5	438	**15.4**
Total	1,561	100.0	1,917	100.0	2,359	100.0	2,461	100.0	2,605	100.0	2,994	100.0	2,839	**100.0**
Columbus														
Ohio State	**206**	**9.3**	**229**	**9.1**	**228**	**7.6**	**236**	**7.6**	**228**	**6.4**	**203**	**5.5**	**154**	**4.0**
University of Cincinnati	90	4.1	141	5.6	190	6.3	157	5.0	196	5.5	222	6.0	214	**5.6**
Riverside Methodist	592	26.6	676	26.8	843	28.2	893	28.7	1,118	31.3	1,058	28.8	1,019	**26.6**
Grant Medical Center	146	6.6	165	6.6	211	7.0	273	8.8	257	7.2	226	6.1	279	**7.3**
Mount Carmel Health	417	18.8	412	16.4	412	13.8	491	15.8	573	16.0	615	16.7	678	**17.7**
Medical College of Ohio	53	2.4	52	2.1	68	2.3	79	2.5	108	3.0	74	2.0	75	**2.0**
Miami Valley	107	4.8	148	5.9	137	4.6	145	4.7	180	5.0	240	6.5	264	6.9
University Hospital	75	3.4	77	3.1	111	3.7	111	3.6	144	4.0	161	4.4	182	**4.8**
Doctors Hospital	122	5.5	69	2.7	95	3.2	105	3.4	112	3.1	140	3.8	204	**5.3**
Cleveland Clinic	414	18.6	550	21.8	698	23.3	622	20.0	657	18.4	741	20.1	761	19.9
Total	2,222	100.0	2,519	100.0	2,993	100.0	3,112	100.0	3,573	100.0	3,680	100.0	3,830	**100.0**

Table L-4-1 (continued)

Medicare Angioplasty Volumes and Market Shares for Demonstration Hospitals and Their Competitors

	1990		1991		1992		1993		1994		1995		1996	
	Medicare PTCAs	Market Share	Medicare PTCAs	Market Share	Medicare PTCAs	Market Share	Medicare PTCAs	Market Share	Medicare PTCAs	Market Share	Medicare PTCAs	Market Share	Medicare PTCAs	Market Share
Ann Arbor														
St. Joseph Mercy - Ann Arbor	**348**	**16.5**	**518**	**18.5**	**525**	**16.4**	**411**	**11.9**	**388**	**9.8**	**341**	**8.1**	**330**	**7.3**
Sinia Hospital	120	5.7	133	4.8	182	5.7	177	5.1	161	4.1	112	2.7	121	2.7
St. Joseph Mercy	78	3.7	111	4.0	107	3.3	120	3.5	126	3.2	140	3.3	134	3.0
University of Michigan	220	10.5	190	6.8	238	7.4	214	6.2	281	7.1	246	5.9	215	4.8
Henry Ford	98	4.7	115	4.1	119	3.7	156	4.5	156	3.9	174	4.1	146	3.2
St. Joseph	24	1.1	39	1.4	56	1.7	88	2.5	127	3.2	121	2.9	77	1.7
Harper	126	6.0	144	5.2	187	5.8	195	5.6	203	5.1	238	5.7	249	5.5
Ingham Medical Center	121	5.8	151	5.4	224	7.0	256	7.4	315	7.9	339	8.1	170	3.8
William Beaumont	627	29.8	897	32.1	983	30.7	1,218	35.1	1,256	31.6	1,222	29.1	1,389	30.8
Mclaren Regional Medical Center	115	5.5	160	5.7	208	6.5	271	7.8	376	9.5	428	10.2	365	8.1
Detroit Osteopathic	28	1.3	21	0.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
St. John's	198	9.4	314	11.2	372	11.6	361	10.4	582	14.7	841	20.0	1,320	29.2
Total	2,103	100.0	2,793	100.0	3,201	100.0	3,467	100.0	3,971	100.0	4,202	100.0	4,516	100.0
Portland														
St. Vincent	**354**	**46.5**	**461**	**50.7**	**503**	**53.1**	446	**49.8**	422	**51.3**	401	49.4	392	**51.4**
Emanuel Hospital	24	3.2	38	4.2	31	3.3	37	4.1	34	4.1	22	2.7	33	4.3
University Hospital	0	0.0	8	0.9	10	1.1	8	0.9	18	2.2	21	2.6	21	2.8
Good Samaritan	234	30.7	216	23.8	247	26.1	243	27.1	228	27.7	236	29.1	189	24.8
Providence Medical Center	149	19.6	186	20.5	157	16.6	162	18.1	120	14.6	131	16.2	127	16.7
Total	761	100.0	909	100.0	948	100.0	896	100.0	822	100.0	811	100.0	762	100.0
Indianapolis														
Methodist	**401**	**26.1**	**492**	**27.9**	**535**	**24.7**	**435**	**22.1**	**454**	**23.7**	**357**	**18.6**	**430**	**21.0**
St. Vincent	751	48.8	845	47.9	1,108	51.1	1,043	53.0	948	49.5	1,102	57.3	1,135	**55.4**
Indiana University	95	6.2	72	4.1	74	3.4	104	5.3	117	6.1	129	6.7	129	6.3
St. Francis	177	11.5	200	11.3	275	12.7	231	11.7	235	12.3	240	12.5	249	12.1
Community Hospital	114	7.4	154	8.7	176	8.1	156	7.9	163	8.5	94	4.9	107	5.2
Total	1,538	100.0	1,763	100.0	2,168	100.0	1,969	100.0	1,917	100.0	1,922	100.0	2,050	100.0

Table L-4-1 (continued)

Medicare Angioplasty Volumes and Market Shares for Demonstration Hospitals and Their Competitors

	1990		1991		1992		1993		1994		1995		1996	
	Medicare PTCAs	Market Share	Medicare PTCAs	Market Share	Medicare PTCAs	Market Share	Medicare PTCAs	Market Share	Medicare PTCAs	Market Share	Medicare PTCAs	Market Share	Medicare PTCAs	Market Share
Houston														
St. Luke's	444	32.8	482	33.9	521	30.5	576	29.2	624	29.1	633	27.4	655	26.4
St. Joseph	37	2.7	61	4.3	68	4.0	52	2.6	39	1.8	37	1.6	33	1.3
Hermann	54	4.0	87	6.1	127	7.4	155	7.9	187	8.7	185	8.0	159	6.4
Bayshore	21	1.6	34	2.4	37	2.2	68	3.4	99	4.6	69	3.0	70	2.8
Memorial	107	7.9	68	4.8	131	7.7	186	9.4	158	7.4	175	7.6	176	7.1
Medical Center Hospital	22	1.6	38	2.7	64	3.7	56	2.8	84	3.9	83	3.6	74	3.0
Methodist	402	29.7	404	28.4	491	28.7	504	25.6	522	24.3	677	29.3	876	35.4
Memorial City	47	3.5	36	2.5	52	3.0	72	3.7	87	4.1	99	4.3	112	4.5
Humana	29	2.1	27	1.9	0	0.0	24	1.2	18	0.8	0	0.0	0	0.0
HCA Spring Branch	53	3.9	35	2.5	36	2.1	43	2.2	66	3.1	119	5.2	102	4.1
Houston Northwest	91	6.7	115	8.1	123	7.2	140	7.1	175	8.2	162	7.0	129	5.2
University of Texas	16	1.2	34	2.4	39	2.3	50	2.5	57	2.7	38	1.6	56	2.3
Other	31	2.3	0	0.0	20	1.2	46	2.3	28	1.3	30	1.3	36	1.5
Total	1,354	100.0	1,421	100.0	1,709	100.0	1,972	100.0	2,144	100.0	2,307	100.0	2,478	100.0

Table L-4-2

Percent of Cases with Medicare Bypass Lengths of Stay Equator Less Than Natural Percentile Threshold, Demonstration Hospitals and Competitors, 1990-96

National	Threshold	Atlanta		Boston		Columbus		Ann Arbor		Portland, OR		Houston		Indianapolis	
Percentile	Days	Demo	Control	Demo	Control	Demo	Control	Demo	Control	Demo	Control	Demo	Control	Demo	Control
1990															
10%	9	32.9 %	22.5 %	14.0 %	11.1 %	13.9 %	19.4 %	18.3 %	14.1 %	21.2 %	49.0 %	13.6 %	12.3 %	24.0 %	14.8 %
25%	11	56.2	44.0	28.6	27.0	23.1	38.4	33.6	30.4	48.7	69.4	32.4	24.9	43.1	33.6
50%	14	75.1	67.3	47.4	50.2	58.0	63.3	58.0	54.2	77.9	87.0	62.4	47.5	61.4	56.7
75%	18	87.8	82.2	67.2	69.5	80.5	80.0	80.5	76.0	89.8	95.8	79.9	68.9	79.3	75.1
90%	25	94.2	91.9	85.7	87.8	91.0	90.1	91.0	90.1	94.3	98.1	92.7	87.5	92.0	88.9
95%	33	97.2	95.8	93.4	93.5	96.1	95.2	96.1	95.2	98.1	99.0	95.7	93.6	95.5	94.7
1991															
10%	9	36.6	22.5	16.5	9.5	11.2	18.4	17.8	14.7	21.5	33.7	9.6	9.5	26.2	15.3
25%	10	60.5	44.0	35.1	24.0	17.6	35.1	34.7	29.9	44.7	58.9	29.3	23.5	48.3	35.8
50%	13	80.7	61.4	64.1	49.9	39.2	63.9	70.6	56.6	79.7	82.9	63.2	49.7	71.1	62.8
75%	17	91.7	79.3	81.9	70.0	69.7	79.8	87.3	76.9	91.4	92.4	80.5	71.3	85.0	80.9
90%	24	95.9	92.0	92.8	87.3	90.0	91.8	97.7	90.5	98.4	96.3	91.8	87.7	94.0	92.1
95%	31	97.4	95.5	94.3	93.7	93.6	95.8	98.3	95.4	99.2	99.0	95.3	93.5	98.4	96.0
1992															
10%	9	47.6	26.6	15.3	13.4	12.1	21.8	26.5	21.2	28.6	45.9	13.5	10.7	33.8	23.9
25%	10	66.4	47.2	38.9	28.7	23.5	40.1	48.4	38.2	61.5	63.6	32.0	23.5	52.8	41.4
50%	12	49.3	64.4	62.9	46.9	42.9	58.4	72.6	55.3	79.6	78.4	54.2	41.3	71.0	30.7
75%	17	89.8	83.6	80.4	74.3	74.2	81.8	89.0	80.7	95.3	93.1	82.3	69.7	86.1	82.3
90%	24	95.0	93.3	92.9	89.6	92.5	92.3	95.3	92.4	97.3	97.1	93.7	87.2	94.4	92.6
95%	30	97.6	96.4	97.3	94.6	95.5	96.2	97.7	96.0	98.8	98.6	97.4	93.3	97.2	95.5
1993															
10%	8	43.1	29.8	10.5	9.0	9.8	14.9	19.2	17.4	19.7	24.6	14.7	10.5	29.7	19.8
25%	9	64.0	50.9	37.4	21.7	21.6	35.0	39.6	33.8	48.9	50.5	34.9	24.5	50.7	38.9
50%	12	82.5	71.3	64.5	47.4	48.6	60.2	68.4	58.0	80.1	78.1	62.9	47.5	75.9	63.9
75%	15	91.1	85.1	82.0	68.3	70.7	78.4	85.5	76.7	94.3	87.8	79.8	68.1	86.3	79.8
90%	21	96.1	92.5	93.2	86.7	85.0	91.2	94.9	90.9	98.4	97.1	91.8	86.1	95.8	91.3
95%	27	97.6	96.7	97.1	93.1	94.0	95.4	97.6	95.1	99.2	98.3	95.9	93.0	97.7	95.8

Table 4-2 (continued)

Distribution of Length of Stay for Medicare Bypass Demonstration Hospitals and Competitors, 1990-96

National Percentile	Threshold Days	Atlanta		Boston		Columbus		Ann Arbor		Portland, OR		Houston		Indianapolis	
		Demo	Control	Demo	Control	Demo	Control	Demo	Control	Demo	Control	Demo	Control	Demo	Control
1994															
10%	7	36.8	25.9	10.1	7.3	22.2	10.2	18.5	11.6	10.2	14.4	5.8	9.2	25.8	13.2
25%	8	62.7	50.2	29.7	20.5	41.7	27.9	39.1	29.1	39.1	42.4	21.5	21.4	49.5	30.6
50%	11	82.4	71.5	58.5	48.9	73.1	58.5	67.3	55.6	74.3	73.2	57.6	43.9	78.2	59.9
75%	14	90.4	83.4	77.9	68.6	87.1	75.6	84.2	73.1	85.1	89.1	74.6	64.5	89.5	78.5
90%	19	96.3	92.8	93.5	87.8	97.4	91.8	95.2	89.5	94.1	97.2	90.0	85.5	97.6	91.3
95%	24	97.4	95.4	98.0	93.4	98.0	95.2	97.9	94.2	97.1	98.4	94.8	92.9	99.1	95.3
1995															
10%	7	49.4	33.9	14.4	10.9	22.4	16.4	20.0	15.0	17.0	20.2	7.9	14.3	32.7	17.2
25%	8	64.8	49.1	29.5	23.8	39.0	30.6	34.7	27.4	33.7	41.8	17.8	23.8	52.1	31.7
50%	10	81.3	69.4	56.5	49.0	57.8	57.4	61.3	51.0	69.6	69.8	47.0	45.5	74.9	57.9
75%	13	91.5	84.4	80.2	72.3	85.4	78.5	83.3	74.2	89.2	88.3	71.7	68.0	90.3	80.5
90%	18	95.2	92.4	92.7	89.0	93.6	91.7	93.8	89.4	97.5	97.6	87.0	85.4	95.8	92.4
95%	22	96.6	95.9	97.5	94.2	96.3	95.7	95.9	93.9	99.0	98.6	91.8	90.8	97.4	96.6
1996															
10%	6	39.4	31.0	16.7	10.0	16.5	15.2	16.0	12.2	12.8	15.8	9.9	13.2	30.9	13.7
25%	7	59.5	48.8	35.5	22.6	30.1	30.7	33.8	26.1	27.2	33.4	17.4	23.1	45.1	29.9
50%	9	81.9	69.2	59.6	52.1	57.6	56.2	61.9	49.5	61.7	66.7	46.2	44.1	72.3	53.3
75%	13	92.5	84.1	82.6	76.4	71.9	79.7	84.8	73.9	86.8	87.4	75.1	66.5	87.7	77.4
90%	17	96.7	93.5	94.8	89.8	88.9	92.3	94.7	88.9	96.3	96.1	89.3	84.7	94.6	89.6
95%	21	98.3	96.7	97.4	94.9	94.0	96.1	97.3	94.3	97.8	97.7	95.0	92.6	96.6	95.2

NOTES:

1. Includes all heart bypass operations, defined as cases in DRG 106 or DRG 107 and cases in DRG 108 with a procedure code of 36.10-36.15 or 36.19.
2. Calendar year data. 1993 values are based on discharges through September 30th.
3. Competitors is an average of all hospitals doing bypasses in market excluding the demonstration hospital.
4. Lengths of stay are adjusted to standardize the proportion of patients in each DRG.
5. Data for St. Vincent's Hospital excludes HMO enrollees.

SOURCE: 1990-93 MedPAR and National Claims History files.

Table L-7-1

Medicare Demonstration Patient Volume By Hospital, DRG, and Period

	HOSPITAL A (N = 1,256)			HOSPITAL B (N = 3,598)			HOSPITAL C (N = 1,973)			HOSPITAL D (N = 754)			HOSPITAL E (N = 753)			HOSPITAL F (N = 1,485)			HOSPITAL G (N = 727)			TOTAL (N = 10,546)		
	DRG 106	DRG 107	Total	DRG 106	DRG 107	Total	DRG 106	DRG 107	Total	DRG 106	DRG 107	Total	DRG 106	DRG 107	Total	DRG 106	DRG 107	Total	DRG 106	DRG 107	Total	DRG 106	DRG 107	Total
Year 1	98	124	222	238	459	697	155	136	291	72	48	120	0	0	0	0	0	0	0	0	0	563	767	1,330
Year 2	88	148	236	227	427	654	190	182	372	81	55	136	3	1	4	0	0	0	9	6	15	598	819	1,417
Year 3	101	143	244	276	407	683	208	172	380	87	42	129	142	132	274	291	262	553	84	63	147	1,189	1,221	2,410
Year 4	106	151	257	324	364	688	198	199	397	99	66	165	123	121	244	216	270	486	20	13	43	1,086	1,184	2,270
Year 5	134	163	297	444	407	851	229	205	434	100	89	189	144	116	260	200	246	446	86	47	133	1,307	1,273	2,580
N Missing DRG			*0*			*19*			*99*			*6*			*0*			*0*			*399*			*523*
N Missing Date of CABG			*0*			*0*			*0*			*5*			*0*			*0*			*0*			*0*
Other DRGs			*0*			*6*			*0*			*4*			*1*			*0*			*0*			*11*
TOTAL	527	729	1,256	1,509	2,064	3,598	980	894	1,973	439	300	754	382	370	753	707	778	1,485	199	129	727	4,745	5,267	10,546

NOTE: 534 observations are either missing or are other DRGs.

SOURCE: Abstracts of clinical records among seven demonstration hospitals, May, 1991 through June, 1996. Hospitals E, F and G entered the demonstration two years later than the original four hospitals, in May, 1993.

Table L-7-2

In-Hospital Unadjusted Mortality By Hospital, DRG and Period

	HOSPITAL A (N = 1,256)				HOSPITAL B (N = 3,598)				HOSPITAL C (N = 1,973)				HOSPITAL D (N = 754)			
	DRG 106 (%)	DRG 107 (%)	Missing DRG (%)	Total (%)	DRG 106 (%)	DRG 107 (%)	Missing DRG (%)	Total (%)	DRG 106 (%)	DRG 107 (%)	Missing DRG (%)	Total (%)	DRG 106 (%)	DRG 107 (%)	Missing DRG (%)	Total (%)
Year 1	7.1	5.7	0.0	6.3	6.7	1.7	0.0	3.4	2.6	2.2	0.0	2.4	5.6	4.2	0.0	5.0
Year 2	13.6	0.7	0.0	5.5	8.4	4.7	20.0	6.0	4.7	3.8	0.0	4.3	4.9	3.6	0.0	4.4
Year 3	5.0	0.7	0.0	2.4	6.2	3.0	0.0	4.1	6.7	1.7	14.3	4.5	5.8	2.4	0.0	4.6
Year 4	3.8	1.3	0.0	2.3	5.6	4.1	0.0	4.8	3.5	1.5	5.0	2.5	4.0	3.0	0.0	3.6
Year 5	3.0	0.6	0.0	1.7	7.0	3.7	0.0	5.4	3.1	3.9	12.0	3.4	6.0	3.4	0.0	4.8
TOTAL	**6.1**	**1.8**	**0.0**	**3.6**	6.7	**3.4**	**5.3**	**4.8**	**4.2**	**2.7**	**8.1**	**3.7**	**5.2**	**3.3**	**0.0**	4.4

	HOSPITAL E (N = 753)				HOSPITAL F (N = 1,485)				HOSPITAL G (N = 727)				TOTAL (N = 10,546)			
	DRG 106 (%)	DRG 107 (%)	Missing DRG (%)	Total (%)	DRG 106 (%)	DRG 107 (%)	Missing DRG (%)	Total (%)	DRG 106 (%)	DRG 107 (%)	Missing DRG (%)	Total (%)	DRG 106 (%)	DRG 107 (%)	Missing DRG (%)	Total (%)
Year 1													5.5	2.6	0.0	3.8
Year 2													7.4	3.7	16.7	5.2
Year 3	4.9	1.5	0.0	3.3	14.4	5.0	0.0	9.9	1.2	0.0	3.2	1.8	7.6	2.6	4.0	5.0
Year 4	4.9	1.6	0.0	3.3	7.4	7.4	0.0	7.4	0.0	0.0	1.6	1.4	5.1	3.7	2.4	4.2
Year 5	0.9	3.4	0.0	2.2	10.0	6.1	0.0	7.8	3.5	4.3	4.8	3.8	5.5	3.8	6.1	4.7
TOTAL	**3.7**	**2.2**	**0.0**	**2.9**	**11.0**	**6.2**	**0.0**	**8.5**	**2.0**	**1.6**	**2.8**	**2.3**	**6.2**	**3.3**	**3.8**	**4.6**

SOURCE: Abstracts of clinical records among seven demonstration hospitals, May, 1991 through June, 1996. Hospitals E, F and G entered the demonstration two years later than the original four hospitals, in May, 1993.

Table L-7-3

In-Hospital Mortality By Demographic Characteristics, All Years Combined

Characteristic	HOSPITAL A (N = 1,256)			HOSPITAL B (N = 3,598)			HOSPITAL C (N =1,973)			HOSPITAL D (N = 754)			HOSPITAL E (N = 753)			HOSPITAL F (N = 1,485)			HOSPITAL G (N = 727)			TOTAL (N = 10,546)		
	Proportion (%)	Mortality Rate (%)	Risk Ratio	Proportion (%)	Mortality Rate (%)	Risk Ratio	Proportion (%)	Mortality Rate (%)	Risk Ratio	Proportion (%)	Mortality Rate (%)	Risk Ratio	Proportion (%)	Mortality Rate (%)	Risk Ratio	Proportion (%)	Mortality Rate (%)	Risk Ratio	Proportion (%)	Mortality Rate (%)	Risk Ratio	Proportion (%)	Mortality Rate (%)	Risk Ratio
Age																								
Under 65	8.2	0.97	0.3	9.2	4.2	1.1	6.9	2.9	1.9	15.2	4.4	1.5	6.8	2.0	1.1	7.7	7.8	1.0	0.4	0.0	0.0	8.1	4.0	1.1
65-69	28.1	3.4	1.0	31.7	3.8	1.0	34.0	1.5	1.0	31.4	3.0	1.0	28.3	1.9	1.0	33.7	7.8	1.0	35.1	1.2	1.0	32.0	3.5	1.0
70-74	32.6	2.7	0.8	32.3	4.5	1.2	29.4	3.8	2.5	25.2	3.7	1.2	33.5	1.6	0.8	30.6	7.9	1.0	33.0	1.7	1.4	31.2	4.1	1.2
75+	30.9	5.4	1.6	26.7	6.6	1.7	29.8	6.3	4.2	24.4	6.5	2.2	31.5	5.5	2.9	28.0	10.1	1.3	31.4	4.4	3.7	28.4	6.6	1.9
Missing	0.24	0.0	0.0	0.08	0.0	0.0	0.0	0.0	0.0	3.7	7.4	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.3	5.7	1.6
Mean Age:	71.3			68.6			71.2			68.4			71.6			71.0			71.9			70.2		
Sex																								
Male	64.0	3.4	1.0	65.5	3.9	1.0	68.0	3.7	1.0	63.0	3.2	1.0	69.7	2.1	1.0	68.0	8.1	1.0	66.4	1.9	1.0	66.3	4.1	1.0
Female	36.0	4.0	1.2	34.5	6.9	1.7	32.0	3.7	1.0	36.7	6.1	1.9	30.3	4.8	2.3	32.0	9.2	1.1	33.6	3.3	1.7	33.6	5.7	1.4
Missing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	50.0	15.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.03	33.3	8.1
Race																								
White	86.2	3.4	1.0	96.2	4.8	1.0	96.3	3.8	1.0	96.3	4.3	1.0	91.8	3.0	1.0	83.1	8.5	1.0	91.2	2.3	1.0	92.5	4.6	1.0
Black	2.5	6.5	1.9	2.6	4.3	0.9	1.9	2.7	0.7	3.4	3.9	0.9	0.8	16.7	5.6	6.2	13.0	1.5	6.5	2.1	0.9	3.2	6.6	1.4
Other	1.9	16.7	4.9	1.1	7.5	1.6	1.1	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0	10.7	5.7	0.7	0.4	0.0	0.0	2.5	6.0	1.3
Missing	9.5	1.7	0.5	0.1	0.0	0.0	0.8	0.0	0.0	0.3	50.0	11.6	0.4	0.0	0.0	0.0	0.0	0.0	1.9	7.1	3.1	1.5	2.5	0.5

N/A = indicates statistic not applicable/not meaningful.

NOTE: Percent distribution may not sum to 100 because of rounding.

SOURCE: Abstracts of clinical records among seven demonstration hospitals, May, 1991 through June, 1996. Hospitals E, F and G entered the demonstration two years later than the original four hospitals, in May, 1993.

Table L-7-4

Inpatient Mortality By Clinical Presentation and Pre-Operative Course, All Years Combined

Characteristic	HOSPITAL A (N = 1,256)			HOSPITAL B (N = 3,598)			HOSPITAL C (N = 1,973)			HOSPITAL D (N = 754)			HOSPITAL E (N = 753)			HOSPITAL F (N = 1,485)			HOSPITAL G (N = 727)			TOTAL (N = 10,546)		
	Proportion (%)	Mortality Rate (%)	Risk Ratio	Proportion (%)	Mortality Rate (%)	Risk Ratio	Proportion (%)	Mortality Rate (%)	Risk Ratio	Proportion (%)	Mortality Rate (%)	Risk Ratio	Proportion (%)	Mortality Rate (%)	Risk Ratio	Proportion (%)	Mortality Rate (%)	Risk Ratio	Proportion (%)	Mortality Rate (%)	Risk Ratio	Proportion (%)	Mortality Rate (%)	Risk Ratio
Clinical Presentation																								
Asymptomatic CAD	0.4	0.0	0.0	7.3	2.3	0.9	0.05	0.0	0.0	0.5	0.0	0.0	2.0	6.7	2.2	0.0	0.0	0.0	6.9	4.0	1.9	3.2	2.7	0.7
Stable Angina	33.3	2.6	1.0	5.6	2.5	1.0	55.6	2.8	1.0	12.1	3.3	1.0	72.8	3.1	1.0	50.0	8.0	1.0	38.9	2.1	1.0	32.1	3.9	1.0
Unstable Angina	24.4	5.5	2.1	56.7	4.5	1.8	25.8	3.9	1.4	69.4	4.2	1.3	2.3	0.0	0.0	1.0	0.0	0.0	18.2	1.5	0.7	33.6	4.3	1.1
Acute MI	40.3	3.4	1.3	29.2	6.6	2.6	9.3	8.2	2.9	16.2	5.7	1.7	14.5	2.8	0.9	39.5	10.6	1.3	35.4	2.7	1.3	26.7	6.4	1.6
Missing Data	1.6	0.0	0.0	1.2	2.4	1.0	9.3	3.8	1.4	1.9	7.1	2.2	8.5	1.6	0.5	9.6	3.5	0.4	0.7	0.0	0.0	4.5	3.2	0.8
Revascularization Priority																								
Elective	36.5	1.1	1.0	65.8	3.4	1.0	31.2	2.1	1.0	45.8	2.6	1.0	55.6	2.6	1.0	88.8	6.4	1.0	47.7	1.4	1.0	55.7	3.5	1.0
Urgent	53.1	3.8	3.5	10.7	4.2	1.2	60.2	3.8	1.8	46.7	4.3	1.7	30.8	1.7	0.7	3.6	17.0	2.7	34.7	1.6	1.1	29.7	3.8	1.1
Emergent	9.8	10.6	9.6	13.6	11.8	3.5	8.6	8.8	4.2	6.8	17.7	6.8	12.4	7.5	2.9	7.5	29.5	4.6	12.4	8.9	6.4	10.7	12.7	3.6
Missing Data	0.6	25.0	22.7	9.9	4.8	1.4	0.0	0.0	0.0	0.8	0.0	0.0	1.2	0.0	0.0	0.1	0.0	0.0	5.2	0.0	0.0	4.0	4.6	1.3
Pre-operative Insertion of IABP																								
Yes	3.4	18.6	6.0	3.7	14.9	3.4	1.2	26.1	7.7	9.0	10.3	2.7	1.7	7.7	2.8	4.7	40.0	11.4	5.6	14.6	9.1	3.7	19.4	5.7
No/Missing Data	96.6	3.1	1.0	96.3	4.4	1.0	98.8	3.4	1.0	90.9	3.8	1.0	96.2	2.8	1.0	38.9	3.5	1.0	94.4	1.6	1.0	88.2	3.4	1.0
Previous CABG																								
Yes	9.1	6.2	1.9	8.8	11.0	2.6	10.9	7.0	2.1	5.7	11.6	3.0	12.6	5.3	2.0	20.4	17.8	2.9	21.6	1.3	0.5	11.8	9.9	2.5
No/Missing Data	90.9	3.3	1.0	91.2	4.2	1.0	89.2	3.3	1.0	94.3	3.9	1.0	87.4	2.6	1.0	79.6	6.1	1.0	78.4	2.6	1.0	88.2	3.9	1.0

N/A = indicates statistic not applicable/not meaningful.

* Elective percentage inconsistent with high percent of cases with unstable angina or AMI within two weeks.

NOTE: Percent distribution may not sum to 100 because of rounding cases unspecified (?)

SOURCE: Abstracts of clinical records among seven demonstration hospitals, May, 1991 through June, 1996. Hospitals E, F and G entered the demonstration two years later than the original four hospitals, in May, 1993.

Table L-7-5

Inpatient Mortality By Coronary Artery Anatomy and Ejection Fraction, All Years Combined

Characteristic	HOSPITAL A (N = 1,256)			HOSPITAL B (N = 3,598)			HOSPITAL C (N = 1,973)			HOSPITAL D (N = 754)			HOSPITAL E (N = 753)			HOSPITAL F (N = 1,485)			HOSPITAL G (N = 727)			TOTAL (N = 10,546)		
	Proportion (%)	Mortality Rate (%)	Risk Ratio	Proportion (%)	Mortality Rate (%)	Risk Ratio	Proportion (%)	Mortality Rate (%)	Risk Ratio	Proportion (%)	Mortality Rate (%)	Risk Ratio	Proportion (%)	Mortality Rate (%)	Risk Ratio	Proportion (%)	Mortality Rate (%)	Risk Ratio	Proportion (%)	Mortality Rate (%)	Risk Ratio	Proportion (%)	Mortality Rate (%)	Risk Ratio
Coronary Artery Anatomy																								
Left Main Coronary Artery Disease (> = 50% Stenosis)																								
Yes	25.2	4.4	1.3	23.8	5.5	1.2	16.7	5.5	1.7	21.6	4.3	0.9	16.3	2.4	0.7	23.8	12.7	1.8	14.3	1.9	0.8	21.3	6.1	1.4
No	70.1	3.3	1.0	68.9	4.7	1.0	80.3	3.2	1.0	75.6	4.6	1.0	74.0	3.4	1.0	73.8	7.1	1.0	85.0	2.4	1.0	73.8	4.3	1.0
Disease in LAD, RCA, and CX among Patients without Critical Stenosis in LMCA Number of Vessels w/ Stenosis > = 70%																								
0.0	3.0	2.6	1.0	0.3	0.0	0.0	0.4	0.0	0.0	1.1	37.5	1.0	3.6	0.0	0.0	0.4	0.0	0.0	0.6	0.0	0.0	1.0	4.0	1.0
1.0	14.6	3.3	1.3	11.3	5.4	1.0	11.3	4.5	1.0	8.9	4.5	0.1	17.9	2.2	1.0	10.1	7.3	1.0	10.6	1.3	1.0	11.8	4.5	1.1
2.0	34.1	3.3	1.3	31.7	4.1	0.8	36.4	3.1	0.7	31.2	3.4	0.1	35.1	3.0	1.1	30.0	5.6	0.8	31.9	3.0	2.3	32.8	3.8	1.0
3.0	43.7	4.0	1.5	49.4	5.3	1.0	49.0	3.7	0.8	56.1	4.5	0.1	33.7	4.3	2.0	57.2	10.3	1.4	56.3	2.2	1.7	49.6	5.3	1.3
Number of Obstructions w/ Stenosis > = 70%																								
0.0	3.0	2.6	1.0	0.3	0.0	0.0	0.4	0.0	0.0	1.1	37.5	1.0	3.6	0.0	0.0	0.4	0.0	0.0	0.6	0.0	0.0	1.0	4.0	1.0
1.0	10.4	2.3	0.9	7.0	4.8	1.0	7.6	4.6	1.0	5.2	2.6	0.1	13.3	3.0	1.0	4.5	9.0	1.0	5.8	0.0	0.0	7.4	4.1	1.0
2.0	22.3	2.5	1.0	19.1	3.8	0.8	24.0	2.7	0.6	15.4	4.3	0.1	21.5	1.2	0.4	10.2	5.3	0.6	19.4	2.8	1.0	19.1	3.2	0.8
3+	34.4	4.2	1.6	42.6	5.2	1.1	48.3	3.2	0.7	54.0	4.2	0.1	35.6	5.2	1.7	58.7	7.3	0.8	59.3	2.6	0.9	46.4	4.8	1.2
Missing all Coronary Anatomy Data	29.9	4.3	0.1	31.1	4.9	0.0	19.7	5.9	0.0	24.4	3.8	0.2	26.0	1.5	0.0	26.2	12.3	0.0	15.0	1.8	0.3	26.2	5.6	0.0
Left Ventricular Ejection Fraction																								
Less than/equal 25	5.0	9.5	3.1	5.0	10.0	3.0	12.6	8.1	4.5	1.3	40.0	13.8	2.7	10.0	4.0	6.8	17.8	2.7	3.3	8.3	7.5	6.1	10.8	3.2
25 <= 35	11.4	5.6	1.8	10.8	10.8	3.3	25.3	4.6	2.6	7.7	6.9	2.4	5.4	7.3	2.9	11.0	9.8	1.5	8.1	0.0	0.0	12.8	7.1	2.1
35 <= 50	22.6	2.1	0.7	22.9	5.7	1.7	30.7	3.0	1.7	22.4	5.9	2.0	13.0	4.1	1.6	17.1	11.0	1.7	7.8	3.5	3.2	21.7	5.0	1.5
50+	58.6	3.1	1.0	53.0	3.3	1.0	30.6	1.8	1.0	60.1	2.9	1.0	64.1	2.5	1.0	64.2	6.5	1.0	12.2	1.1	1.0	49.5	3.4	1.0
Missing data	2.4	6.7	2.2	8.3	3.3	1.0	0.9	5.6	3.1	8.5	3.1	1.1	14.7	0.9	0.4	0.9	14.3	2.2	68.5	2.4	2.2	9.8	2.9	0.9
Mean Ejection Fraction	51.5			48.3			42.1			54.5			59.5			55.1			41.2			49.5		

N/A = indicates statistic not applicable/not meaningful.

NOTE: Percent distribution may not sum to 100 because of rounding.

SOURCE: Abstracts of clinical records among seven demonstration hospitals, May, 1991 through June, 1996. Hospitals E, F and G entered the demonstration two years later than the original four hospitals, in May, 1993.

Table L-7-6

In-Hospital Mortality By Patient Co-Morbidities, All Years Combined

Characteristic	HOSPITAL A (N = 1,256) Proportion (%)	Mortality Rate (%)	Risk Ratio	HOSPITAL B (N = 3,598) Proportion (%)	Mortality Rate (%)	Risk Ratio	HOSPITAL C (N = 1,973) Proportion (%)	Mortality Rate (%)	Risk Ratio	HOSPITAL D (N = 754) Proportion (%)	Mortality Rate (%)	Risk Ratio	HOSPITAL E (N = 753) Proportion (%)	Mortality Rate (%)	Risk Ratio	HOSPITAL F (N = 1,485) Proportion (%)	Mortality Rate (%)	Risk Ratio	HOSPITAL G (N = 727) Proportion (%)	Mortality Rate (%)	Risk Ratio	TOTAL (N = 10,546) Proportion (%)	Mortality Rate (%)	Risk Ratio
Chronic Renal Failure																								
Yes	8.8	12.6	4.7	17.2	7.6	1.8	4.4	15.1	4.7	7.6	8.8	2.3	6.2	8.5	3.3	11.4	13.0	1.6	1.4	0.0	0.0	10.4	9.6	2.4
No/Missing Data	91.2	2.7	1.0	82.9	4.2	1.0	95.5	3.2	1.0	92.3	3.9	1.0	93.8	2.6	1.0	88.6	7.9	1.0	98.6	2.4	1.0	89.6	4.0	1.0
Congestive Heart Failure																								
Yes	24.4	5.2	1.7	13.0	8.5	2.0	12.5	7.7	2.5	14.9	8.0	2.4	7.4	5.4	5.4	13.3	11.6	1.5	5.6	0.0	0.0	13.6	7.7	1.9
No/Missing Data	75.6	3.1	1.0	87.0	4.2	1.0	87.5	3.1	1.0	81.0	3.3	1.0	92.6	1.0	1.0	86.7	8.0	1.0	94.4	2.5	1.0	86.2	4.1	1.0
Stroke																								
Yes	11.0	4.4	1.3	10.4	5.4	1.1	8.5	4.8	1.3	12.2	5.4	1.3	11.0	4.8	1.8	8.9	12.9	1.6	0.0	0.0	0.0	9.3	6.1	1.4
No/Missing Data	89.0	3.5	1.0	89.6	4.7	1.0	91.5	3.6	1.0	87.4	4.3	1.0	89.0	2.7	1.0	91.1	8.1	1.0	100.0	2.3	1.0	90.6	4.5	1.0
Hypertension																								
Yes	77.2	4.3	3.9	64.8	4.8	1.0	64.9	4.3	1.7	66.3	4.4	1.0	57.9	3.4	1.5	69.8	8.6	1.0	49.4	2.0	0.7	65.6	5.0	1.3
No/Missing Data	22.8	1.1	1.0	35.2	4.6	1.0	33.8	2.6	1.0	33.0	4.4	1.0	42.1	2.2	1.0	30.2	8.2	1.0	50.6	2.7	1.0	34.2	4.0	1.0
Diabetes																								
Yes	32.1	4.7	1.5	29.1	5.7	1.3	30.5	4.5	1.3	30.1	5.7	1.5	27.6	3.4	1.2	29.6	7.3	0.8	29.2	0.9	0.3	29.8	5.1	1.2
No/Missing Data	67.8	3.1	1.0	70.9	4.4	1.0	68.9	3.4	1.0	69.9	3.8	1.0	72.4	2.8	1.0	70.4	9.0	1.0	70.8	2.9	1.0	70.1	4.4	1.0
Chronic Obstructive Pulmonary Disease																								
Yes	14.9	5.9	1.8	30.5	5.1	1.1	9.4	6.0	1.7	9.3	2.9	0.7	10.0	2.7	0.9	23.4	10.1	1.3	10.7	1.3	0.5	19.3	5.8	1.3
No/Missing Data	85.1	3.2	1.0	69.5	4.6	1.0	90.5	3.5	1.0	86.7	4.4	1.0	90.0	3.0	1.0	76.6	8.0	1.0	89.3	2.5	1.0	80.4	4.3	1.0

N/A = indicates statistic not applicable/not meaningful.

NOTE: Percent distribution may not sum to 100 because of rounding.

SOURCE: Abstracts of clinical records among seven demonstration hospitals, May, 1991 through June, 1996. Hospitals E, F and G entered the demonstration two years later than the original four hospitals, in May, 1993.

Table L-7-7

IN-HOSPITAL MORTALITY BY HEIGHT AND BODY SURFACE AREA, ALL YEARS COMBINED

Characteristic	HOSPITAL A (N = 1256)			HOSPITAL B (N = 3,598)			HOSPITAL C (N = 1,973)			HOSPITAL D (N = 754)			HOSPITAL E (N = 753)			HOSPITAL F (N = 1,485)			HOSPITAL G (N = 727)			TOTAL (N = 10,546)		
	Proportion (%)	Mortality Rate (%)	Risk Ratio	Proportion (%)	Mortality Rate (%)	Risk Ratio	Proportion (%)	Mortality Rate (%)	Risk Ratio	Proportion (%)	Mortality Rate (%)	Risk Ratio	Proportion (%)	Mortality Rate (%)	Risk Ratio	Proportion (%)	Mortality Rate (%)	Risk Ratio	Proportion (%)	Mortality Rate (%)	Risk Ratio	Proportion (%)	Mortality Rate (%)	Risk Ratio
Height (in meters)																								
Less than 1.65	31.6	3.8	1.0	24.8	7.7	1.5	26.3	3.1	1.0	29.3	7.2	3.1	24.0	4.4	1.8	24.2	9.2	1.0	31.0	3.1	1.7	26.5	5.9	1.3
1.65-1.74	34.3	3.7	1.0	29.7	5.1	1.0	31.1	3.1	1.0	34.2	2.3	1.0	32.9	2.4	1.0	30.0	8.8	1.0	22.7	1.8	1.0	30.6	4.4	1.0
1.75-1.84	27.1	2.7	0.7	37.3	3.1	0.6	33.9	3.6	1.2	26.4	4.0	1.7	34.3	1.9	0.8	35.9	8.1	0.9	22.4	1.8	1.0	33.2	3.8	0.9
1.85+	6.1	5.2	1.4	7.3	2.7	0.5	4.6	4.4	1.4	7.2	3.7	1.6	8.0	5.0	2.1	6.7	7.1	0.8	2.2	0.0	0.0	6.3	4.1	0.9
Missing Data	0.9	9.1	2.5	0.8	3.5	0.7	4.2	12.2	3.9	2.9	4.6	2.0	0.8	0.0	0.0	3.3	8.2	0.9	21.7	2.5	1.4	3.4	5.9	1.3
Body Surface Area																								
Less than 1.75	22.0	2.9	0.8	20.6	8.1	2.5	16.8	3.6	1.3	20.2	8.6	5.4	14.9	6.3	2.3	18.9	10.0	1.2	16.5	1.7	1.0	19.1	6.5	1.7
1.75-1.95	31.3	4.6	1.2	31.6	5.2	1.6	31.9	3.8	1.4	31.0	4.3	2.7	31.7	2.1	0.8	29.9	7.9	0.9	31.1	3.1	1.8	31.3	4.8	1.3
1.95-2.10	19.7	3.2	0.9	25.1	3.0	0.9	25.4	2.6	0.9	20.7	3.9	2.4	25.9	2.6	0.9	24.0	8.2	1.0	21.9	1.9	1.1	23.9	3.6	0.9
2.10+	17.0	3.7	1.0	21.9	3.2	1.0	21.5	2.8	1.0	25.2	1.6	1.0	24.0	2.8	1.0	23.8	8.5	1.0	16.5	1.7	1.0	21.5	3.8	1.0
Missing Data	10.0	2.4	0.6	0.9	3.2	1.0	4.4	13.8	4.9	2.9	4.6	2.9	3.5	0.0	0.0	3.4	7.8	0.9	14.0	2.9	1.7	4.2	5.4	1.4

N/A = indicates statistic not applicable/not meaningful.

NOTE: Percent distribution may not sum to 100 because of rounding.

SOURCE: Abstracts of clinical records among seven demonstration hospitals, May, 1991 through June, 1996. Hospitals E, F and G entered the demonstration two years later than the original four hospitals, in May, 1993.

Table L-7-8

In-Hospital Mortality By Characteristics of CABG Surgery, All Years Combined

Characteristic	HOSPITAL A (N = 1,256) Proportion (%)	Mortality Rate (%)	Risk Ratio	HOSPITAL B (N = 3,598) Proportion (%)	Mortality Rate (%)	Risk Ratio	HOSPITAL C (N = 1,973) Proportion (%)	Mortality Rate (%)	Risk Ratio	HOSPITAL D (N = 754) Proportion (%)	Mortality Rate (%)	Risk Ratio	HOSPITAL E (N = 753) Proportion (%)	Mortality Rate (%)	Risk Ratio	HOSPITAL F (N = 1,485) Proportion (%)	Mortality Rate (%)	Risk Ratio	HOSPITAL G (N = 727) Proportion (%)	Mortality Rate (%)	Risk Ratio	TOTAL (N = 10,546) Proportion (%)	Mortality Rate (%)	Risk Ratio
Number of Conduits																								
0	3.5	4.6	2.0	0.6	18.2	3.9	0.2	0.0	0.0	0.9	14.3	2.8	0.3	0.0	0.0	0.1	0.0	0.0	3.0	0.0	0.0	1.0	6.9	1.5
1	3.7	4.4	1.9	3.2	12.2	2.6	3.5	5.9	1.4	7.3	1.8	0.3	15.5	5.1	1.5	5.5	12.2	1.4	6.1	0.0	0.0	5.0	7.0	1.5
2	17.9	7.6	3.3	14.7	5.7	1.2	18.6	1.9	0.5	28.6	3.2	0.6	32.1	2.5	0.7	17.1	11.0	1.3	20.6	1.3	0.4	18.8	4.9	1.0
3	40.8	2.3	1.0	37.1	4.7	1.0	41.8	4.1	1.0	48.1	5.2	1.0	35.5	3.4	1.0	41.1	8.7	1.0	39.3	3.5	1.0	39.8	4.7	1.5
4	28.3	2.8	1.2	32.4	4.2	0.9	28.8	4.0	1.0	13.4	4.0	0.8	14.5	0.9	0.3	29.9	6.5	0.7	24.8	2.8	0.8	27.7	4.1	0.9
5+	5.9	2.7	1.2	12.1	3.0	0.6	7.2	3.5	0.9	1.6	8.3	1.6	2.1	0.0	0.0	6.3	6.4	0.7	6.2	0.0	0.0	7.8	3.3	0.7
Type of Conduit																								
IMA/GEPA	81.2	2.8	1.0	59.7	2.9	1.0	56.5	2.4	1.0	54.8	2.9	1.0	51.3	1.6	1.0	74.0	5.9	1.0	61.4	1.1	1.0	62.8	3.1	1.0
IMA/GEPA ONLY	2.4	0.0	0.0	1.7	8.2	2.8	1.3	3.9	1.6	3.7	3.6	1.2	4.9	2.7	1.7	2.6	7.9	1.3	2.3	0.0	0.0	2.3	4.6	1.5
SVG	91.2	3.6	1.3	95.2	4.4	1.5	95.2	3.7	1.5	91.3	4.5	1.6	83.4	2.6	1.6	94.1	8.3	1.4	90.7	2.6	2.4	93.1	4.5	1.5
SVG ONLY	1.3	12.5	4.5	1.5	16.7	5.8	2.1	7.1	3.0	3.6	0.0	0.0	10.6	6.3	3.9	3.0	15.9	2.7	3.7	0.0	0.0	2.8	9.0	2.9
Revascularization Index*																								
Less than 1.0	12.3	8.4	2.9	9.4	8.6	1.9	10.2	1.5	0.4	29.7	4.0	1.0	23.0	5.8	2.3	39.3	8.7	1.0	22.4	3.1	1.4	17.4	6.5	1.5
1.0 +	80.0	2.9	1.0	83.1	4.5	1.0	86.5	3.8	1.0	66.5	4.2	1.0	63.8	2.5	1.0	57.9	8.4	1.0	76.3	2.2	1.0	76.8	4.3	1.0
Perfusion Time (minutes)																								
60 or less	12.6	1.2	0.5	26.7	2.6	0.7	18.4	1.7	0.5	4.6	0.0	0.0	30.8	1.7	0.5	48.4	5.7	0.7	13.9	2.0	0.8	24.4	3.1	0.8
61-100	58.7	2.4	1.0	53.5	3.7	1.0	58.8	3.3	1.0	32.6	2.0	1.0	40.8	3.3	1.0	35.8	8.5	1.0	46.8	2.4	1.0	49.7	3.7	1.0
101+	27.2	7.0	2.9	18.7	10.6	2.9	21.1	6.7	2.0	60.5	5.9	3.0	14.2	6.5	2.0	11.3	19.8	2.3	38.1	2.2	0.9	23.1	8.0	2.2
Missing Data	1.6	5.0	2.1	1.1	12.5	3.4	1.7	3.0	0.9	2.3	5.9	3.0	14.2	0.9	0.3	4.5	10.5	1.2	1.2	11.1	4.6	2.8	5.8	1.6

IMA/GEPA = Internal mammary artery/gastro-epiploid artery

* Revascularization Index equals number of conduits / number of obstructions.

N/A = indicates mortality rate not applicable/not meaningful.

NOTE: Percent distribution may not sum to 100 because of rounding.

SOURCE: Abstracts of clinical records among seven demonstration hospitals, May, 1991 through June, 1996. Hospitals E, F and G entered the demonstration two years later than the original four hospitals, in May, 1993.

Table L-7-9

In-Hospital Mortality By Reoperation

Characteristic	HOSPITAL A (N = 1,256) Proportion (%)	Mortality Rate (%)	Risk Ratio	HOSPITAL B (N = 3,598) Proportion (%)	Mortality Rate (%)	Risk Ratio	HOSPITAL C (N = 1,977) Proportion (%)	Mortality Rate (%)	Risk Ratio	HOSPITAL D (N = 754) Proportion (%)	Mortality Rate (%)	Risk Ratio	HOSPITAL E (N = 753) Proportion (%)	Mortality Rate (%)	Risk Ratio	HOSPITAL F (N = 1,485) Proportion (%)	Mortality Rate (%)	Risk Ratio	HOSPITAL G (N = 733) Proportion (%)	Mortality Rate (%)	Risk Ratio	TOTAL (N = 10,556) Proportion (%)	Mortality Rate (%)	Risk Ratio
Reoperation																								
Year 1																								
Yes	11.3	12.0	2.1	5.7	20.0	8.3	4.1	16.7	9.3	11.6	7.1	1.5										6.8	15.4	5.1
No/Missing Data	88.7	5.6	1.0	94.3	2.4	1.0	95.9	1.8	1.0	88.4	4.7	1.0										93.2	3.0	1.0
Year 2																								
Yes	7.6	0.0	0.0	4.4	20.7	3.8	6.2	13.0	3.5	5.9	37.5	16.3										5.5	15.4	3.3
No/Missing Data	92.4	6.0	1.0	95.6	5.4	1.0	93.8	3.7	1.0	94.1	2.3	1.0										94.5	4.7	1.0
Year 3																								
Yes	6.6	6.3	2.9	2.4	17.7	4.7	4.6	11.1	2.5	7.8	30.0	12.0	13.1	11.1	5.3	8.3	28.3	3.4	2.9	12.5	8.3	5.9	17.9	4.3
No/Missing Data	93.4	2.2	1.0	97.6	3.8	1.0	95.4	4.5	1.0	92.3	2.5	1.0	86.9	2.1	1.0	91.7	8.3	1.0	97.1	1.5	1.0	94.1	4.2	1.0
Year 4																								
Yes	2.3	16.7	8.4	2.6	38.9	10.0	6.4	13.8	6.6	3.6	50.0	26.3	2.1	20.0	6.9	10.1	26.5	5.0	0.9	0.0	0.0	4.6	25.2	7.9
No/Missing Data	97.7	2.0	1.0	97.4	3.9	1.0	93.7	2.1	1.0	96.4	1.9	1.0	97.9	2.9	1.0	89.9	5.3	1.0	99.1	1.4	1.0	95.4	3.2	1.0
Year 5																								
Yes	1.7	20.0	11.8	2.5	38.1	8.3	2.8	15.4	4.3	9.6	21.1	7.5	1.3	0.0	0.0	7.0	9.7	1.3	2.3	20.0	5.3	3.6	19.6	4.7
No/Missing Data	98.3	1.7	1.0	97.5	4.6	1.0	97.2	3.6	1.0	90.4	2.8	1.0	98.7	2.2	1.0	93.1	7.7	1.0	97.7	3.8	1.0	96.4	4.2	1.0

NOTE: Reoperation here refers to having to operate again following an initial CABG surgery during the same admission; it does not mean that the initial CABG surgery was the patient's second.

SOURCE: Abstracts of clinical records among seven demonstration hospitals, May, 1991 through June, 1996. Hospitals E, F and G entered the demonstration two years later than the original four hospitals, in May, 1993.

Table L-7-10

In-Hospital Mortality By Post-Operative Complications, All Years Combined

Characteristic	HOSPITAL A (N = 1,256) Proportion (%)	Mortality Rate (%)	Risk Ratio	HOSPITAL B (N = 3,598) Proportion (%)	Mortality Rate (%)	Risk Ratio	HOSPITAL C (N = 1,973) Proportion (%)	Mortality Rate (%)	Risk Ratio	HOSPITAL D (N = 754) Proportion (%)	Mortality Rate (%)	Risk Ratio	HOSPITAL E (N = 753) Proportion (%)	Mortality Rate (%)	Risk Ratio	HOSPITAL F (N = 1,485) Proportion (%)	Mortality Rate (%)	Risk Ratio	HOSPITAL G (N = 727) Proportion (%)	Mortality Rate (%)	Risk Ratio	TOTAL (N = 10,546) Proportion (%)	Mortality Rate (%)	Risk Ratio
Complications																								
Any Complications																								
Yes	29.7	11.8	118.0	29.1	16.4	410.0	56.6	6.5	1.0	31.3	14.0	1.0	35.1	8.3	1.0	29.2	29.0	1.0	12.5	18.7	1.0	33.8	13.7	456.7
No/Missing Data	70.3	0.1	1.0	70.9	0.04	1.0	43.4	0.0	0.0	68.3	0.0	0.0	64.9	0.0	0.0	70.8	0.0	0.0	87.5	0.0	0.0	66.2	0.03	1.0
Infection																								
Yes	5.4	7.4	2.2	4.8	23.8	6.3	3.7	5.5	1.5	4.5	11.8	3.0	1.2	0.0	0.0	3.2	10.4	1.2	1.4	0.0	0.0	3.9	14.3	3.4
No/Missing Data	94.6	3.4	1.0	95.2	3.8	1.0	96.3	3.6	1.0	95.4	4.0	1.0	98.8	3.0	1.0	96.8	8.4	1.0	98.6	2.4	1.0	96.1	4.2	1.0
Neurologic																								
Yes	2.6	18.2	5.7	5.0	20.6	5.2	8.6	11.2	3.7	3.9	6.9	1.7	17.1	6.2	2.8	0.0	0.0	0.0	3.7	7.4	3.5	5.4	13.1	3.2
No/Missing Data	97.4	3.2	1.0	95.0	4.0	1.0	91.4	3.0	1.0	95.8	4.0	1.0	82.9	2.2	1.0	100.0	8.5	1.0	96.3	2.1	1.0	94.6	4.1	1.0
Pulmonary																								
Yes	6.8	10.6	3.4	13.3	10.9	2.8	12.4	14.7	7.0	9.0	14.7	4.3	4.8	8.3	3.1	12.8	11.6	1.5	3.7	18.5	10.9	10.7	12.1	3.3
No/Missing Data	93.2	3.1	1.0	86.7	3.9	1.0	87.6	2.1	1.0	91.0	3.4	1.0	95.2	2.7	1.0	87.2	8.0	1.0	96.3	1.7	1.0	89.3	3.7	1.0
Renal																								
Yes	1.9	29.2	9.4	1.5	39.6	9.2	5.0	22.2	8.2	1.6	58.3	16.7	1.3	40.0	16.7	1.2	55.6	7.0	0.1	0.0	0.0	2.1	32.7	8.2
No/Missing Data	98.1	3.1	1.0	98.5	4.3	1.0	95.0	2.7	1.0	98.4	3.5	1.0	98.7	2.4	1.0	98.8	7.9	1.0	99.9	2.3	1.0	97.9	4.0	1.0
Vascular																								
Yes	0.8	20.0	5.7	0.0	0.0	0.0	1.6	28.1	8.5	1.9	21.4	5.2	12.8	3.1	1.1	1.6	17.4	2.1	0.3	0.0	0.0	1.7	11.9	2.6
No/Missing Data	99.2	3.5	1.0	100.0	4.8	1.0	98.4	3.3	1.0	98.1	4.1	1.0	87.2	2.9	1.0	98.4	8.3	1.0	99.7	2.3	1.0	98.3	4.5	1.0
Post-Op AMI																								
Yes	2.2	3.6	1.0	0.2	0.0	0.0	1.6	9.4	2.6	0.5	50.0	12.2	6.2	2.1	0.7	3.6	22.6	2.9	0.1	0.0	0.0	1.6	11.1	2.5
No/Missing Data	97.8	3.6	1.0	99.8	4.8	1.0	98.4	3.6	1.0	99.5	4.1	1.0	93.8	3.0	1.0	96.4	7.8	1.0	99.9	2.3	1.0	98.4	4.5	1.0
Re-Op for Bleeding																								
Yes	3.3	9.8	2.9	0.0	0.0	0.0	2.1	19.1	5.6	2.9	31.8	8.8	4.5	8.8	3.4	4.5	22.4	2.9	1.2	22.2	10.6	2.0	18.1	4.1
No/Missing Data	96.7	3.4	1.0	100.0	4.8	1.0	97.9	3.4	1.0	97.1	3.6	1.0	95.5	2.6	1.0	95.5	7.8	1.0	98.8	2.1	1.0	98.0	4.4	1.0
Other																								
Yes	4.9	51.6	46.9	12.4	21.7	9.0	11.4	16.0	7.6	18.2	18.3	14.1	4.9	27.0	15.9	5.4	38.8	5.7	2.9	23.8	14.0	9.6	23.4	9.0
No	95.1	1.1	1.0	87.6	2.4	1.0	88.6	2.1	1.0	81.8	1.3	1.0	95.1	1.7	1.0	94.6	6.8	1.0	97.1	1.7	1.0	90.4	2.6	1.0

N/A = indicates not applicable/not meaningful.

NOTE: Percent distribution may not sum to 100 because of rounding.

SOURCE: Abstracts of clinical records among seven demonstration hospitals, May, 1991 through June, 1996. Hospitals E, F and G entered the demonstration two years later than the original four hospitals, in May, 1993.

Table L-7-11

Length of Stay for DRG 106, By Hospital and Period

	HOSPITAL A (N=1,256)			HOSPITAL B (N=3,598)			HOSPITAL C (N=1,973)			HOSPITAL D (N=754)			HOSPITAL E (N=753)			HOSPITAL F (N=1,485)			HOSPITAL G (N=727)			TOTAL (N=10,546)		
	Total LOS	Pre-Op	Post-Op	Total LOS	Pre-Op	Post-Op	Total LOS	Pre-Op	Post-Op	Total LOS	Pre-Op	Post-Op	Total LOS	Pre-Op	Post-Op	Total LOS	Pre-Op	Post-Op	Total LOS	Pre-Op	Post-Op	Total LOS	Pre-Op	Post-Op
Year 1																								
Mean	15.8	4.9	10.3	12.6	2.6	9.8	13.1	3.5	9.6	17.1	5.0	11.6										13.9	3.5	10.1
Standard Error	0.7	0.3	0.6	0.5	0.1	0.5	0.3	0.2	0.3	1.0	0.3	0.9										0.3	0.1	0.3
Year 2																								
Mean	14.8	3.7	10.2	11.4	2.4	8.7	12.3	3.4	8.7	16.2	4.5	11.4	9.3	1.3	8.0				9.7	1.8	7.9	12.7	3.2	9.3
Standard Error	0.8	0.3	0.7	0.4	0.1	0.4	0.3	0.2	0.2	0.8	0.3	0.7	0.9	0.7	0.6				1.7	0.7	1.7	0.3	0.1	0.2
Year 3																								
Mean	13.8	3.8	8.7	9.5	1.7	7.8	12.7	3.3	9.1	14.7	4.9	8.7	11.1	2.2	8.9	12.2	2.0	10.1	11.6	2.9	8.5	11.8	2.6	8.9
Standard Error	0.6	0.3	0.4	0.3	0.1	0.3	0.4	0.2	0.3	0.7	0.3	0.5	0.4	0.2	0.3	0.3	0.1	0.3	0.6	0.2	0.5	0.2	0.1	0.1
Year 4																								
Mean	12.5	4.1	8.5	9.9	2.0	8.0	11.8	3.4	8.2	11.7	4.2	7.0	10.5	2.1	8.3	12.6	1.9	10.6	8.8	1.6	7.3	11.3	2.6	8.5
Standard Error	0.5	0.2	0.4	0.4	0.1	0.3	0.4	0.2	0.3	0.5	0.2	0.4	0.3	0.2	0.3	0.4	0.1	0.4	0.6	0.3	0.5	0.2	0.1	0.2
Year 5																								
Mean	11.5	3.6	7.8	8.8	1.6	7.1	10.8	3.1	7.6	11.6	4.1	7.3	10.2	2.0	8.2	12.0	1.9	9.9	9.6	2.0	7.3	10.3	2.4	7.8
Standard Error	0.4	0.2	0.3	0.3	0.1	0.2	0.3	0.1	0.2	0.6	0.2	0.5	0.3	0.2	0.3	0.5	0.1	0.4	0.5	0.2	0.3	0.1	0.1	0.1

Notes: Reported pre-op and post-op length of stay may not sum to the reported total length of stay. Total length of stay was defined as discharge date minus admission date, post-op as discharge date minus CABG surgery date.

Total length of stay, however was defined as one day if admission and discharge occurred on the same day, while pre- and post-op lengths of stay were permitted to equal 0.

Sources: Abstracts of clinical records among four demonstration hospitals, May 1991 through June 1996.

Hospitals E, F, and G entered the demonstration two years later than the original four hospitals, in May, 1993.

Table L-7-12

Length of Stay for DRG 107, By Hospital and Period

	HOSPITAL A (N=1,256)			HOSPITAL B (N=3,598)			HOSPITAL C (N=1,973)			HOSPITAL D (N=754)			HOSPITAL E (N=753)			HOSPITAL F (N=1,485)			HOSPITAL G (N=727)			TOTAL (N=10,546)		
	Total LOS	Pre-Op	Post-Op	Total LOS	Pre-Op	Post-Op	Total LOS	Pre-Op	Post-Op	Total LOS	Pre-Op	Post-Op	Total LOS	Pre-Op	Post-Op	Total LOS	Pre-Op	Post-Op	Total LOS	Pre-Op	Post-Op	Total LOS	Pre-Op	Post-Op
Year 1																								
Mean	11.0	1.4	9.6	10.3	1.1	9.2	10.7	1.5	9.2	16.2	2.1	13.7										10.8	1.3	9.5
Standard Error	0.5	0.1	0.4	0.3	0.1	0.3	0.3	0.1	0.3	1.5	0.3	1.4										0.2	0.04	0.2
Year 2																								
Mean	10.5	1.5	8.9	9.4	1.0	8.4	10.1	1.3	8.6	12.3	1.7	10.5	8.0	2.0	6.0				7.5	1.0	6.5	9.9	1.2	8.6
Standard Error	0.4	0.1	0.3	0.3	0.1	0.2	0.3	0.2	0.3	0.7	0.3	0.7	–	–	–				0.8	0.4	0.6	0.2	0.04	0.2
Year 3																								
Mean	9.5	1.5	7.7	8.4	1.0	7.4	9.2	1.2	8.0	11.0	1.4	9.7	9.4	1.4	8.0	12.1	1.0	11.1	9.1	0.9	8.2	9.7	1.1	8.5
Standard Error	0.3	0.1	0.2	0.2	0.1	0.2	0.3	0.1	0.2	1.2	0.2	1.2	0.2	0.1	0.2	0.3	0.1	0.3	0.5	0.2	0.4	0.1	0.04	0.1
Year 4																								
Mean	9.4	1.4	7.9	8.1	0.9	7.2	8.9	1.0	7.8	7.5	0.9	6.6	9.4	1.1	8.4	11.8	0.7	11.0	8.0	1.5	6.5	9.3	1.0	8.3
Standard Error	0.3	0.1	0.3	0.2	0.1	0.2	0.3	0.1	0.2	0.4	0.2	0.4	0.4	0.0	0.4	0.4	0.1	0.4	0.7	0.4	0.5	0.1	0.04	0.1
Year 5																								
Mean	8.4	1.1	7.3	7.5	1.0	6.5	8.6	1.0	7.6	8.6	1.4	7.0	8.9	1.1	7.8	11.0	0.8	10.1	7.5	0.5	7.0	8.7	1.0	7.6
Standard Error	0.3	0.1	0.3	0.2	0.1	0.2	0.3	0.1	0.3	0.5	0.2	0.4	0.2	0.1	0.2	0.4	0.1	0.4	0.7	0.1	0.7	0.1	0.04	0.1

Notes: Reported pre-op and post-op length of stay may not sum to the reported total length of stay. Total length of stay was defined as discharge date minus admission date, post-op as discharge date minus CABG surgery date.

Total length of stay, however was defined as one day if admission and discharge occurred on the same day, while pre- and post-op lengths of stay were permitted to equal 0.

Sources: Abstracts of clinical records among four demonstration hospitals, May 1991 through June 1996.

Hospitals E, F, and G entered the demonstration two years later than the original four hospitals, in May, 1993.

Table L-7-13

Mean Values By Year By Hospital For Risk Factors Used In In-Hospital Mortality Logistic Analysis

Hospital A	Year 1	Year 2	Year 3	Year 4	Year 5
DDEAD	0.06	0.06	0.02	0.02	0.02
URGENT	0.53	0.52	0.45	0.67	0.49
EMERGE	0.13	0.11	0.09	0.10	0.07
PREVCABG	0.07	0.09	0.10	0.08	0.11
UNSTABLE	0.56	0.64	0.15	0.01	0.00
MI2WEEK	0.06	0.03	0.52	0.63	0.64
DRG	0.44	0.37	0.41	0.41	0.45
CHF	0.24	0.34	0.14	0.18	0.31
DIABETES	0.30	0.29	0.32	0.33	0.36
STROKE	0.14	0.11	0.11	0.10	0.09
COPD	0.09	0.14	0.12	0.21	0.16
HYPER	0.73	0.71	0.82	0.81	0.78
RENAL	0.09	0.11	0.11	0.09	0.06
AGE	71.69	70.75	70.90	71.51	71.41
AGE 65-69	0.27	0.21	0.32	0.35	0.26
AGE 70-74	0.32	0.35	0.32	0.30	0.34
AGE 75-79	0.27	0.22	0.21	0.20	0.20
AGE 80+	0.09	0.09	0.06	0.09	0.10
BSA	1.89	1.88	1.91	1.94	1.93
SEX	0.38	0.42	0.34	0.33	0.34
HEIGHT	168.83	167.59	169.32	169.88	169.54
IABP	0.09	0.09	0.01	0.00	0.00
ARTERY70	2.31	2.43	1.80	2.06	2.45
LMCA	0.22	0.26	0.21	0.32	0.25
LVEF	0.11	0.14	0.16	0.19	0.20

SOURCE: Abstracts of clinical records from the demonstration hospitals, May 1991 through June 1996.

Table L-7-13 (continued)

Mean Values By Year By Hospital For Risk Factors Used In In-Hospital Mortality Logistic Analysis

Hospital B	Year 1	Year 2	Year 3	Year 4	Year 5
DDEAD	0.03	0.06	0.04	0.05	0.05
URGENT	0.01	0.02	0.05	0.14	0.28
EMERGE	0.14	0.17	0.17	0.15	0.07
PREVCABG	0.07	0.11	0.09	0.10	0.08
UNSTABLE	0.53	0.59	0.67	0.60	0.57
MI2WEEK	0.27	0.24	0.28	0.29	0.26
DRG	0.34	0.34	0.40	0.47	0.52
CHF	0.11	0.12	0.13	0.16	0.14
DIABETES	0.17	0.30	0.33	0.30	0.35
STROKE	0.04	0.09	0.13	0.13	0.12
COPD	0.26	0.21	0.34	0.38	0.32
HYPER	0.49	0.61	0.73	0.71	0.69
RENAL	0.04	0.17	0.25	0.19	0.20
AGE	60.12	70.48	70.63	70.45	70.99
AGE 65-69	0.30	0.32	0.32	0.33	0.31
AGE 70-74	0.35	0.32	0.34	0.31	0.31
AGE 75-79	0.18	0.19	0.19	0.19	0.20
AGE 80+	0.07	0.07	0.06	0.07	0.09
SEX	0.34	0.34	0.34	0.34	0.37
BSA	1.95	1.95	1.97	1.93	1.95
HEIGHT	171.55	171.84	173.14	171.51	170.82
IABP	0.01	0.02	0.02	0.05	0.07
ARTERY70	2.02	2.03	2.45	2.56	2.41
LMCA	0.21	0.22	0.26	0.26	0.24
LVEF	0.12	0.17	0.14	0.19	0.16

SOURCE: Abstracts of clinical records from the demonstration hospitals, May 1991 through June 1996.

Table L-7-13 (continued)

Mean Values By Year By Hospital For Risk Factors Used In In-Hospital Mortality Logistic Analysis

Hospital C	Year 1	Year 2	Year 3	Year 4	Year 5
DDEAD	0.02	0.04	0.05	0.03	0.04
URGENT	0.55	0.60	0.58	0.61	0.64
EMERGE	0.11	0.07	0.12	0.06	0.08
PREVCABG	0.11	0.10	0.12	0.12	0.09
UNSTABLE	0.22	0.23	0.32	0.32	0.20
MI2WEEK	0.21	0.18	0.08	0.02	0.02
DRG	0.53	0.51	0.53	0.43	0.50
CHF	0.11	0.11	0.15	0.13	0.12
DIABETES	0.30	0.29	0.31	0.32	0.29
STROKE	0.09	0.07	0.09	0.08	0.10
COPD	0.08	0.10	0.09	0.09	0.10
HYPER	0.58	0.67	0.68	0.66	0.64
RENAL	0.01	0.06	0.05	0.04	0.05
AGE	71.13	71.34	71.10	71.25	70.97
AGE 65-69	0.37	0.37	0.34	0.33	0.31
AGE 70-74	0.31	0.29	0.29	0.28	0.30
AGE 75-79	0.19	0.22	0.18	0.25	0.20
AGE 80+	0.08	0.07	0.11	0.08	0.10
BSA	1.94	1.94	1.95	1.96	1.95
SEX	0.28	0.30	0.35	0.32	0.34
HEIGHT	166.79	170.93	168.60	169.09	168.21
IABP	0.01	0.02	0.01	0.01	0.01
ARTERY70	2.11	2.28	2.40	2.45	2.47
LMCA	0.15	0.26	0.17	0.12	0.14
LVEF	0.47	0.35	0.37	0.35	0.37

SOURCE: Abstracts of clinical records from the demonstration hospitals, May 1991 through June 1996.

Table L-7-13 (continued)

Mean Values By Year By Hospital For Risk Factors Used In In-Hospital Mortality Logistic Analysis

Hospital D	Year 1	Year 2	Year 3	Year 4	Year 5
DDEAD	0.05	0.04	0.05	0.04	0.05
URGENT	0.45	0.55	0.63	0.45	0.31
EMERGE	0.07	0.07	0.09	0.07	0.05
PREVCABG	0.04	0.05	0.09	0.07	0.04
UNSTABLE	0.98	0.73	0.67	0.67	0.66
MI2WEEK	0.02	0.11	0.14	0.12	0.19
DRG	0.60	0.60	0.67	0.60	0.51
CHF	0.10	0.07	0.14	0.25	0.15
DIABETES	0.35	0.29	0.28	0.30	0.30
STROKE	0.07	0.10	0.14	0.12	0.16
COPD	0.15	0.09	0.06	0.08	0.08
HYPER	0.69	0.64	0.65	0.61	0.70
RENAL	0.15	0.03	0.11	0.05	0.06
AGE	67.96	69.46	69.64	69.51	66.15
AGE 65-69	0.36	0.31	0.35	0.29	0.30
AGE 70-74	0.23	0.27	0.30	0.27	0.21
AGE 75-79	0.15	0.15	0.19	0.19	0.18
AGE 80+	0.04	0.07	0.06	0.07	0.08
BSA	1.97	1.92	1.91	1.97	2.04
SEX	0.36	0.35	0.35	0.36	0.41
HEIGHT	171.40	170.92	170.32	170.33	168.75
IABP	0.03	0.07	0.08	0.10	0.14
ARTERY70	2.55	2.61	2.66	2.33	2.35
LMCA	0.07	0.17	0.31	0.28	0.20
LVEF	0.07	0.09	0.09	0.08	0.11

SOURCE: Abstracts of clinical records from the demonstration hospitals, May 1991 through June 1996.

Table L-7-13 (continued)

Mean Values By Year By Hospital For Risk Factors Used In In-Hospital Mortality Logistic Analysis

	Hospital E			Hospital F			Hospital G		
	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
DDEAD	0.03	0.03	0.02	0.10	0.07	0.08	0.02	0.01	0.04
URGENT	0.18	0.44	0.33	0.03	0.02	0.05	0.26	0.41	0.40
EMERGE	0.12	0.12	0.13	0.08	0.07	0.07	0.11	0.12	0.14
PREVCABG	0.16	0.13	0.09	0.23	0.20	0.18	0.42	0.04	0.10
UNSTABLE	0.07	0.00	0.00	0.29	0.28	0.21	0.17	0.16	0.22
MI2WEEK	0.16	0.14	0.14	0.14	0.11	0.16	0.36	0.39	0.31
DRG	0.52	0.50	0.50	0.53	0.44	0.45	0.57	0.47	0.65
CHF	0.11	0.08	0.02	0.13	0.11	0.16	0.02	0.08	0.08
DIABETES	0.26	0.31	0.26	0.28	0.30	0.31	0.24	0.31	0.34
STROKE	0.10	0.12	0.11	0.08	0.07	0.13	0.00	0.00	0.00
COPD	0.12	0.05	0.13	0.20	0.23	0.28	0.08	0.14	0.11
HYPER	0.55	0.59	0.60	0.69	0.68	0.73	0.47	0.51	0.50
RENAL	0.05	0.07	0.07	0.10	0.12	0.12	0.01	0.00	0.03
AGE	71.92	71.29	71.62	70.54	71.25	71.32	71.79	72.08	71.96
AGE 65-69	0.30	0.29	0.26	0.38	0.34	0.29	0.33	0.38	0.34
AGE 70-74	0.33	0.34	0.33	0.28	0.32	0.33	0.36	0.30	0.32
AGE 75-79	0.24	0.18	0.23	0.20	0.18	0.20	0.24	0.21	0.23
AGE 80+	0.08	0.11	0.10	0.07	0.09	0.10	0.07	0.11	0.11

Table L-7-13 (continued)

Mean Values By Year By Hospital For Risk Factors Used In Inpatient Mortality Logistic Analysis

	Hospital E			Hospital F			Hospital G		
	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
BSA	1.96	1.97	1.96	1.95	1.96	1.94	1.94	1.94	1.91
SEX	0.29	0.30	0.32	0.33	0.30	0.33	0.33	0.35	0.32
HEIGHT	159.94	172.01	171.40	170.97	171.34	171.11	168.99	168.46	168.98
IABP	0.01	0.02	0.02	0.00	0.05	0.10	0.04	0.06	0.07
ARTERY70	1.81	2.04	1.99	2.44	2.57	2.59	2.46	2.57	2.46
LMCA	0.15	0.18	0.17	0.24	0.23	0.25	0.07	0.18	0.20
LVEF	0.07	0.10	0.07	0.17	0.18	0.18	0.12	0.11	0.11

SOURCE: Abstracts of clinical records from the demonstration hospitals, May 1991 through June 1996.

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